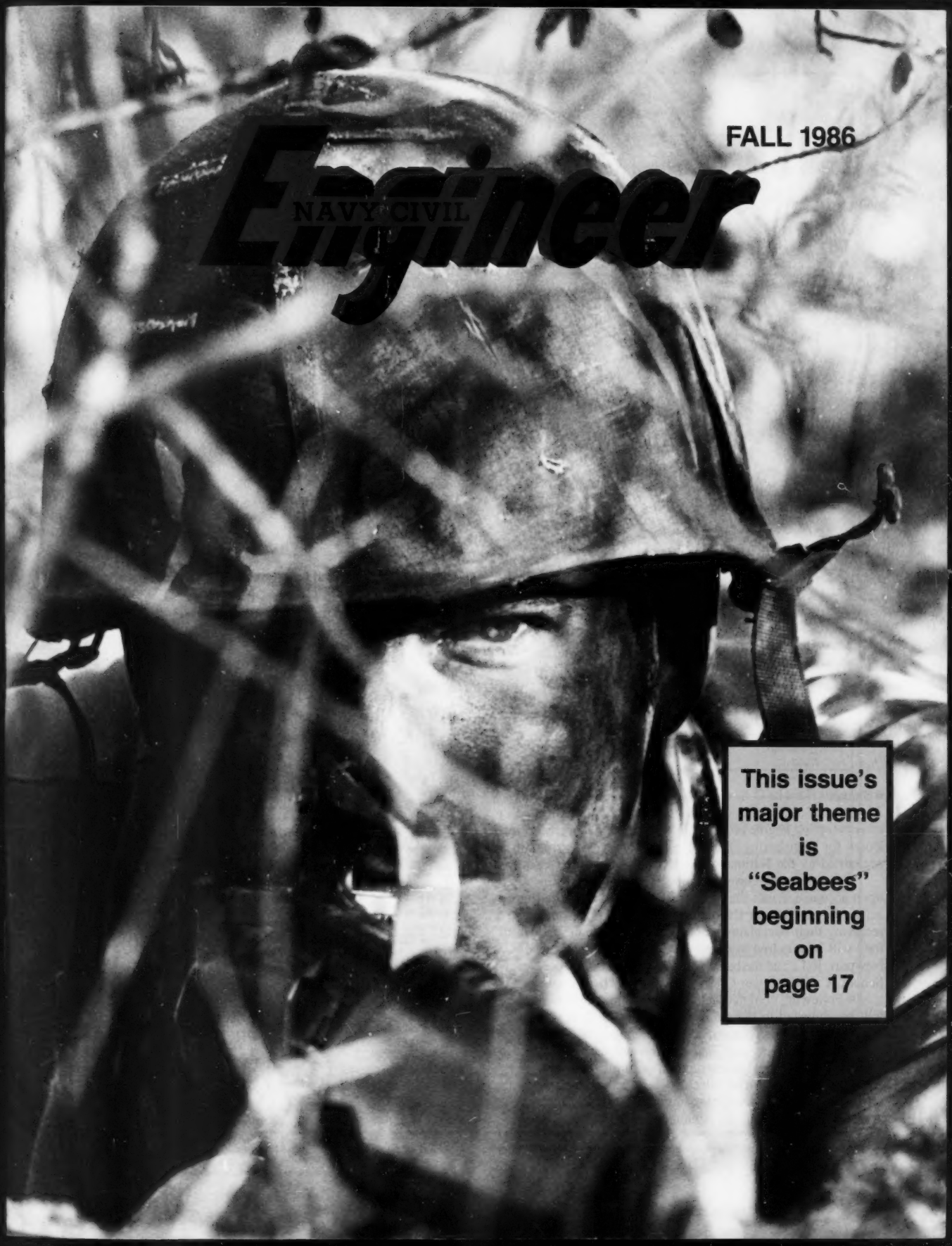

NAVY CIVIL Engineer

FALL 1986

This issue's major theme is "Seabees" beginning on page 17

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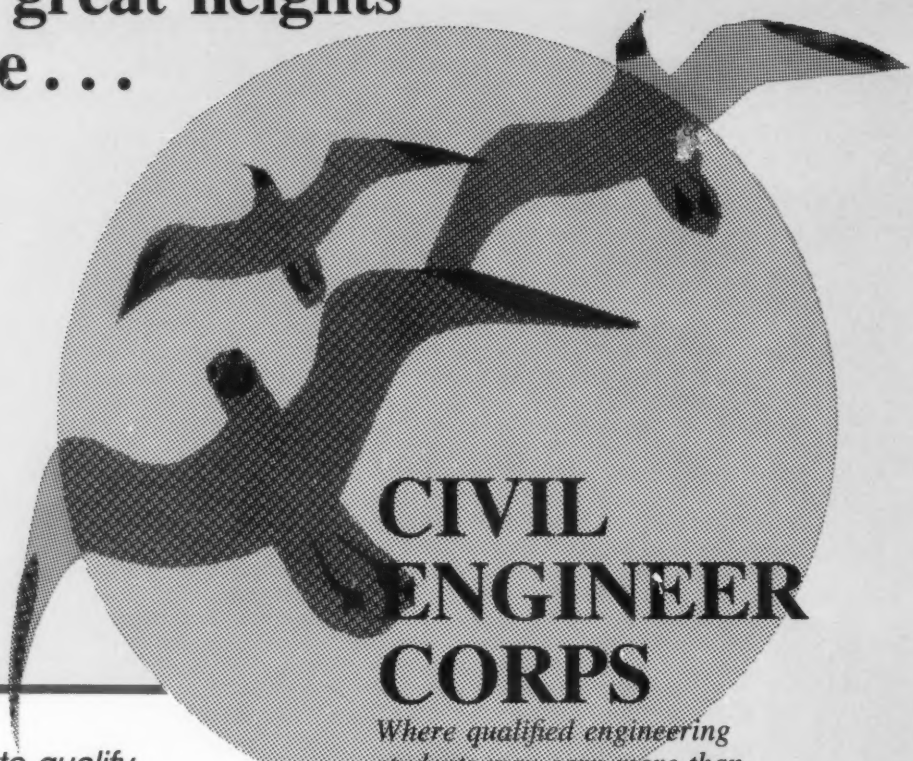

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THE COVER

The photo of the camouflaged Seabee on the cover of this issue is from the camera of PH3 Billy Jennings of NMCB-1, Gulfport, Miss. The photo was received in the editorial office accompanying an article on the battalion's training exercises and appeared on page 17 of the Spring 1986 issue. It seemed like an appropriate photo for the cover of this issue which features Seabees as its major theme.

Navy Civil Engineer

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WINTER 1987	Public Works	Oct 15, 1986	Jan. 2-15, 1986
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FALL 1987	Contracting	July 15, 1987	Oct. 1-15, 1987

*It is hoped to have several articles in each issue on the major theme, but no issue will be made up only of theme articles. All subject matter is welcome and will be considered for publication.

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An Innovative Approach

Energy reduction thru third-party contracting

By LT GREGORY L. MAFFETT, CEC, USN
E. I. T., Pa.

The Navy has tried to meet its FY 1985 energy goals through a combination of energy engineering, technology application projects, and various energy conservation efforts. While these efforts have met with some success, there haven't been enough resources to reach our energy reduction goals. To get there we need to do something new. Third party contracting is new and innovative.

The Navy's normal method of contracting could be called "two party" contracting. The two parties are the Navy, who puts up the capital and operates the facility, and the contractor, who builds it. We are now, however, getting into something termed "third party" contracting. This involves the financier who puts up the capital, the contractor who builds and operates the project, and the Navy who pays the contractor, but only if he performs as advertised.

Why would the Navy want to introduce the third party? First, the Navy does not have to invest any capital in these projects — it saves its money for ships, planes, etc. Second, the contractor not only builds the project, he also operates it. This frees the government from operation costs and also takes advantages of the contractor's operational expertise.

Northern Division (NORTHDIV) of the Naval Facilities Engineering Command (NAVFAC) is currently working on three third party energy projects for the Naval Base at Great Lakes. These projects are the pilot shared savings contract, the basewide shared savings contract, and also the cogeneration contract.

Although these are three contracts, they amount to a two-pronged attack on energy expenditures at Great Lakes. The goal of shared savings is to reduce consumption of energy while the purpose of cogeneration is to reduce the cost of the energy consumed.

Shared Savings

The object of shared savings contracts is to reduce the cost of energy by reducing consumption. The plan is to hire a contractor to install energy conservation equipment, initiate energy conservation programs, and do whatever he can to reduce energy consumption. The contractor would then get paid a share of the savings generated as a result of his actions. If savings are not generated the contractor gets nothing.

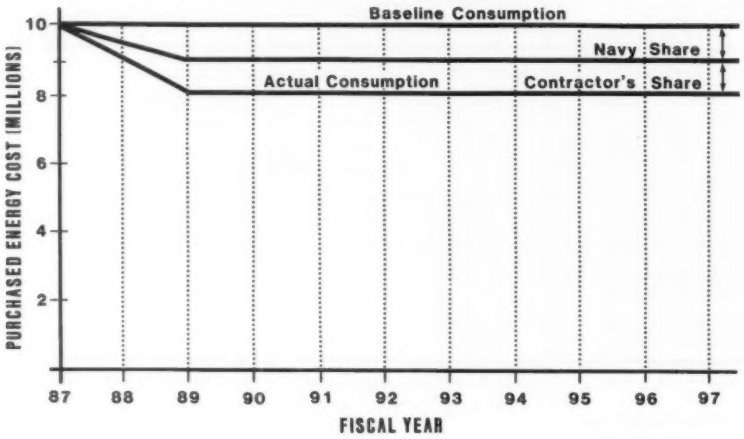
The quantity of savings is determined by comparing an energy baseline with actual consumption. This baseline has been developed by the Navy Energy & Environmental Support Activity (NEESA) for both Great Lakes shared savings contracts. Great Lakes and NEESA gathered steam consumption data by installing meters to measure power plant output over time. NEESA combined this information with electrical consumption data and about 40 other variables regarding environmental and base loading conditions and used multiple linear regressions (MLR) to develop the baselines. Now, with baselines established, actual consumption can be compared to predicted consumption and the difference is the savings resulting from the contracts.

Obviously, the accuracy of the baseline is critical to the success of the project. The industry standard for acceptable error is less than 2 percent of predicted consumption. The baselines generated by NEESA produce an average yearly error of 0.20 percent for electricity and 1.07 percent for fuel. This is well within the established limits, and with annual corrections should serve quite well through the life of the contract.

The term of the contracts will be at least seven years. This will allow the contractor time to pay off his capital investment and make a profit on the effort. It might seem more cost effective to do the projects ourself and cut out the contractor's profit, but in the long run this may not be the case. The winning contractor will have two advantages over the government that can improve his profit figure. One is the absence of the government bureaucracy. Although he has to meet quality construction standards, he is not restricted to triservice specifications, ECIPs, ETAPs, MILCONs, etc. He can do what is most cost effective immediately. Second, his profits are tied to his performance at saving energy; his main concern is saving energy. In a public works environment, the focus is spread over many areas and full-time attention cannot be given to energy if other work is to be done.

These two contracts will be breaking new ground for NAVFAC. Of these two contracts, the pilot contract will be one of the first shared savings contracts in the federal government. It's one of five contracts in NAVFAC's pilot program to investigate various methods of soliciting and administer-

Shared Savings Projections



ing shared savings contracts. Once it is awarded and in operation, the lessons learned will be incorporated into the basewide contract and other future shared savings efforts.

The basewide contract is the most profitable at Great Lakes. The Navy is waiting for congressional authority to enter into multi-year contracts of this type, and when authority is granted, a savings between $1 and $2 million a year out of Great Lakes' purchased energy bill should be realized. Should these shared savings efforts succeed, the Navy plans to export the concept to other branches of the government. The Navy is the lead activity in this enterprise that could save the federal government $100 to $400 million a year.

Cogeneration

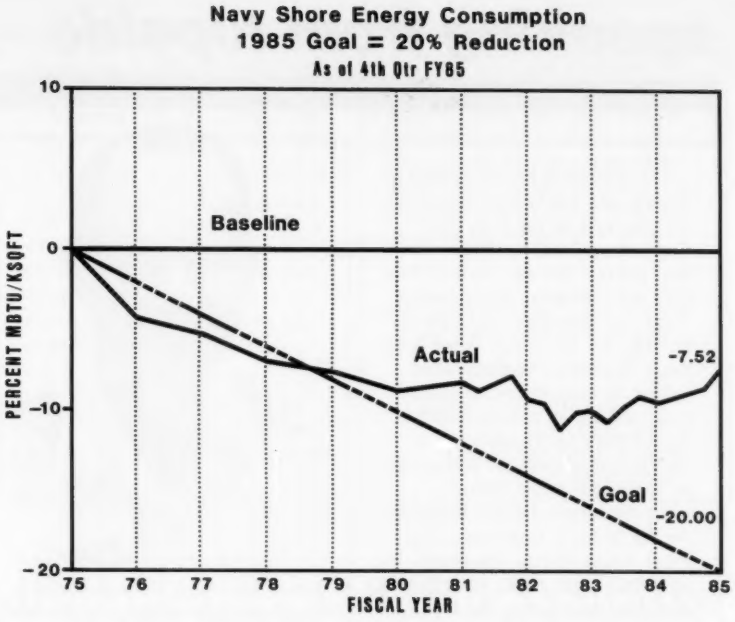
Cogeneration is the other method of attacking energy costs at Great Lakes. This method is direct. The object is to reduce the cost of steam and electricity to the Public Works Center (PWC) Great Lakes. The proposed method of achieving this is to have a third party come in, build a plant, and sell a combination of steam and electricity to Great Lakes.

Cogeneration is the generation of both thermal and electric energy from the same fuel source. The concept is not new, cogeneration has been around for many years. It is experiencing a resurgence, however, because of the increased cost of purchased electricity and the comparative efficiency of the process.

The cost of electricity has risen because of increased fuel costs and the relatively high capital cost of building nuclear plants. Cogeneration maintains an efficiency advantage over the electric utility because it gets double duty from its thermal energy and it minimizes transmission losses by being located closer to the load.

Thus, cogeneration gives us an opportunity to contract for an efficient generation system located on base and capable of competition with the electric company and PWC's power plant. Studies conducted by NORTHDIV lead us to believe that in Great Lakes' case, the contractors will have difficulty competing with PWC steam cost, but will be able to compete successfully with the local utility's electric rate.

The method used to solicit a cogeneration contractor will be a Request for Proposals (RFP). This was chosen over the Invitation for Bids (IFB) to allow the government flexibility in negotiations and to maximize competition and innovation on the contractor's part. The RFP has become a de facto industry standard that has been used successfully by state governments and private industry.



One interesting area of the RFP is the financing. Third party contracts are financed under a system called project financing as opposed to the conventional credit financing arrangement that most people are familiar with.

Under credit financing, if you so desire, you can get a loan to build a football stadium, and then blow it up. The bankers do not mind as long as your credit rating is good.

In project financing, however, the contractor has to convince the financial backers that the project will make money over its lifetime. This determination is made based on predictions of income from the final negotiated contract.

This is one of the primary reasons for going with the RFP. An IFB, which is relatively inflexible, could be written in such a way that the bankers would refuse to finance it. An RFP gives the government more flexibility to negotiate with the contractor to produce a contract that is acceptable to the government, the contractor, and the financial backers.

Regarding the cost of cogenerating with a third party vs. in-house, we found that a third party contractor, by his ability to negotiate contracts, manage operations, and properly structure his financing, could provide energy at about the same cost as the government had we bought the equipment and operated it ourselves. Obviously, the driving reason to pursue third party financing over government financing is to get the service without any capital expenditure.

The projected savings resulting from this contract are expected to be in the $350,000 to $700,000 per year range. This project requires no legislative initiatives and we expect to have a contract out for bids by the end of FY 86.

Summary

It is apparent that with increasing pressure to cut defense budgets, we cannot expect increased funding for energy projects. If anything, funds are likely to be cut. However, if we are to reduce future utility expenditures, we have to do something innovative at once. Third-party-financed energy projects that use part of next year's utility funds to generate next year's savings could answer many energy conservation problems. This is not the answer to all energy problems — ETAPS, ECIPs, and MILCONs will still be around, but third party financing will augment the existing system and provide the government with some leverage in achieving future energy savings. □

speaking from topside

I am pleased to have the honor of writing this article since the theme for this issue of the *Navy Civil Engineer* is Seabees. The Seabees have a proud heritage. Today's Seabees are continuing in the Seabee "Can-Do" tradition. I will provide an overview of what is being done today in addition to preparation gained on deployment, in homeport, and during normal Reserve Active Duty for Training (ACDUTRA) to prepare the Seabees to be successful in the future.

As the former Deputy Commander for Military Readiness (Seabees), I have had the opportunity to work with many outstanding people dedicated to ensuring the Naval Construction Force (NCF) is ready in every way for mobilization whenever called upon again.

The total effort is a demonstration of cooperation and enthusiasm. From the Chief of Naval Operations (OPNAV) staff down through each successive echelon of command there has been real cooperation and a true integration of effort between the active and reserve components of the NCF.

The purpose of having Seabees is to support the operation plans (OPLANs) of the Commanders-in-Chief (CINC) to whom the Seabee units are allotted. In order to successfully execute an OPLAN, there has to be a proper combining of valid tasking, an adequate number of trained personnel, the correct equipment, the availability of materials, and sufficient air or sea transportation to deliver all of this to the geographic area in which the Operational Commander requires support by the Seabees.

The approach that we have taken to make all of this happen has been to define deficiencies and problems connected with mobilization readiness of the Seabees and then institutionalize solutions.

The Civil Engineering Support Plan (CESP) is the annex of the OPLAN that specifies the projected facility construction and repair

workload. The CESPs are being developed and validated by Reserve Civil Engineer Corps officers on two weeks of ACDUTRA. They are being indoctrinated and coordinated by OPNAV, the Naval Facilities Engineering Command Headquarters (NAVFACENGCOM), and Commander, Reserve Naval Construction Force (COMRNCF), and are successfully working through appropriate Engineering Field Division staffs and augmenting CINC staffs.

The tasking with regard to Seabee responsibilities associated with fleet hospitals, rapid runway repair, war damage repair, and underwater construction is being expanded and clarified. The Assistant Chief of Staff for Construction Management, an organization within the Reserve Naval Construction Force (RNCF) which fills an active slot on the staff of Commander-in-Chief, U.S. Naval Forces, Europe (CINCUSNAVEUR) is working to prepare for its mobilization role as Regional Wartime Construction Manager for the CINCUSNAVEUR geographic area.

Significant gains are being made in outfitting the Reserves and improving the active Tables of Allowance (TOAs). New procedures for issuing equipment to the active Seabee units have been implemented. The RNCF has been structured and prioritized and completion of outfitting is being accomplished on a unit-by-unit basis.

Readiness reporting is being altered to reflect actual status of individual units vice assuming equipment and material are available in Prepositioned War Reserve Stocks. Efforts are underway to reduce lead time for spare parts support of new equipment by one-third.

Standard ISO containers are being procured for the NCF to convert Seabee units from mount-out boxes to containerized TOAs. This will align the Seabees with the increasing number of container ships replacing break-bulk cargo ships.

The TOA for the amphibious Assault Follow-on Echelon (AFOE) is being refined and coordinated with the Assault Echelon and peacetime training allowances to minimize outfitting outlays but guaranteeing the adequacy of allowances.

Communications allowances have been improved and procurement of secure-voice communications equipment is underway. Arrangements have been made to upgrade the Seabee weapons allowance with the most modern version of respective weapons and munitions.

Personnel in all Seabee units are being provided complete state-of-the-art CBR masks, clothing, and equipment. Fresh water-producing ability is being enhanced through development of a modern air-transportable well-drilling rig and evaluating other alternate sources such as reverse osmosis water purification units.

Development of the Seabee Automated Mobile Management (SAMM) System to provide a true unit-wide modern computer capability is nearing completion. Procurement of desk-top and portable computers with associated hardware will begin early in

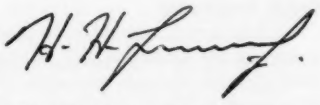
FY 1987. Software for Seabee unique functions is being developed.

An extended study is ongoing to restructure some Seabee battalions into smaller units whose capabilities are more closely tailored to CINC requirements in order to reduce the portion of the CINC's allotted transportation consumed by Seabee units. The set of subjects associated with mobilizing and deploying Seabee units, defining operational control (OPCON) relationships, guaranteeing transportation for equipment and material, and keeping OPLAN documentation current through representation at OPLAN refinement conferences, is being pursued on a coordinated basis by CINC, NAVFAC, NCF, and USMC staffs.

The value of being proactive in Joint Chiefs of Staff/Wargaming exercises is now better appreciated. The benefits of participation in CINC and USMC exercises are clear. Active participation in the planning of future exercises has begun.

Finally, R&D tasks and initiatives are being defined to begin R&D now to produce the kind of Seabee force envisioned necessary for the 21st century.

The requirement to ensure the NCF is ready is recognized. The tasks involved have been defined and structured. All those involved are working hard to accomplish these tasks. Cooperation and communication are making things happen. We are making good progress.



Captain Herbert H. Lewis, Jr., CEC, USN
Deputy and Chief of Staff
COMCBPAC

Needed — reliable quality control systems!

By M. G. MITCHUM, DIRECTOR
Financial Accounting Division
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Quality assurance should be a major concern to every government employee. Current criticism directed at government employees in general should be a personal affront to each of us. It should encourage us to evaluate our individual performances to determine if the criticism is justified. Even if it is not, it should encourage us to try even harder to ensure the product we produce or the service we provide is of the highest quality.

Quality control is a function often talked about, but not seriously considered; few seriously consider the matter except during crisis situations. It then becomes of utmost importance until the crisis is solved. We then tend to lapse into our "business as usual" mode instead of analyzing the situation to see if our quality control procedures need improving.

An Engineering Field Division (EFD) produces many products and services in support of the fleet. In order for the fleet to maintain a constant state of readiness, products and services must be the best that can be provided. To achieve this we must establish and maintain reliable quality control systems. Each organizational component must identify those measurable products, e.g., projects managed, contracts awarded, change orders issued, etc., and establish a quality control system to accurately measure quality and quantity performance standards for each employee. The following is the process required to establish such a system:

- Identify product or service
- Establish acceptable levels of quality and quantity
- Identify and define required data elements for measuring quality and quantity
- Establish report formats for accumulating performance data
- Develop employee job elements and performance standards for the product being produced and ensure each employee understands the elements upon which he / she will be rated as well as the level of expected performance.
- Determine automated data processing (ADP) hardware / software requirements
- Establish and test local data base
- Establish update schedule and output frequency

A financial management information system does have measurable products such as financial documents, contractor/vendor invoices, financial reports and reviews performed. In the Financial Accounting Division, one of the most important functions is the processing of financial documents because they are the source data from which the activity's financial status is produced to satisfy all reporting requirements.

A financial quality control system is mandatory because of the very nature of the function and the many fiscal and legal constraints involved. Because of this, such a system has been established for the Document and Input Branch, Financial Accounting Division in the Southern Division that produces very good results. The system utilizes IV Phase ADP Equipment and is used for the following functions:

Financial Document Control File.

Each document received is immediately input to the system and automatically assigned a Document Reference Number (DRN). The documents are passed to accounting technicians for mark-up and entering on the Amalgaman data base.

In the mark-up and entering process, each document is microfilmed. A numbering attachment on the camera automatically prints a Document Control Number (DCN) on each document. The DCN includes the fiscal year, month, version, cartridge number, and a four-digit serial number.

The cartridge and serial number are the numbers by which the document is entered on the Amalgaman data base. After filming, each document is entered on the IV Phase terminal. During the entering process, the Document Control File DRN record is automatically update with the DCN, the techni-

cian's initials, and the date processed.

Prompt Payment Invoice Log.

This file satisfies all of the requirements of the Prompt Payment Act. It also includes the payment amount, payment release date, and check number entered from the Payment Register. A late Payment Reason Code and an Activity Code responsible for a late payment is entered if applicable.

Batch Processing.

All transactions entered on IV Phase terminals are stored locally on tape until the end of each workday. The total input is batch processed to the Facility Systems Offices (FACSO), Port Hueneme, Calif., for inclusion in the next scheduled update.

This method of input eliminates any lost time due to FACSO system problems or defective communication lines. However, there is a slight risk of not getting any data transmitted on an update day because of a total system failure.

Measurement of Performance Standards.

Each accounting technician has a quality and quantity standard. Statistical reports are produced at the end of each month reflecting each technician's performance.

Annual performance ratings are based on these statistics. Employee performance is monitored during the year and assistance is provided when necessary to ensure satisfactory performance.

Productivity.

In addition to increased productivity noted above, productivity will also be improved by identifying problem areas such as a high volume of administrative change orders because of administrative errors and by taking remedial action.

Productivity in other EFD organizational components will also be improved. Poor quality work by any component has a ripple effect on all.

Improved Management.

A good quality control system provides essential data for management decisions such as workload indicators (current and projected), training requirements, staffing, performance ratings, etc.

Based on the results of our Financial Quality Control System, we are convinced quality control does work. If all EFD elements implement good quality control systems, the financial system will be enhanced and overall EFD performance improved.

Measurement of Corporate Goals.

This system is also used to ensure the NAVFAC established goal for processing contractor/vendor invoices is met. It is also used to monitor unreleased invoices to ensure all invoices are paid when due.

Document Follow-up.

At the end of each month a follow-up list is produced reflecting all documents received that did not get processed. This permits timely determination of why they were not processed and ensures prompt disposition.

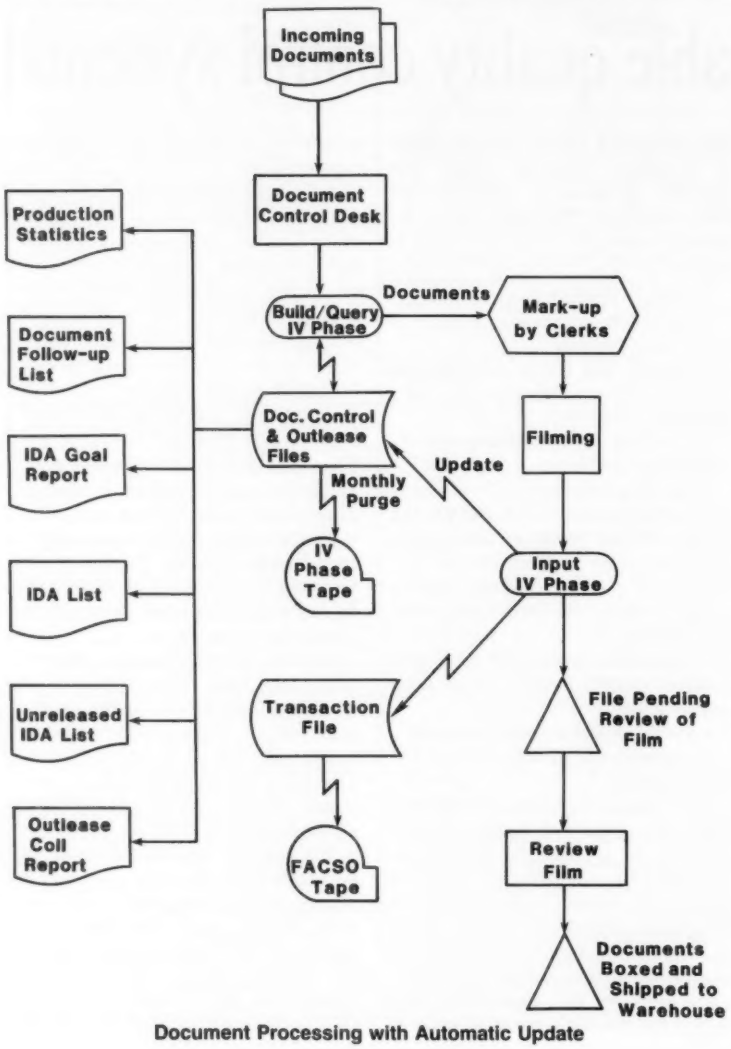
This file includes documents that will not be entered in Amalgaman data base; however, the disposition field indicates the reason for non-entry. Some documents require additional action prior to entry.

A follow-up date is entered to ensure disposition is accomplished in a timely manner. An exception listing is produced for each follow-up date. If disposition action was not accomplished, tracer action is initiated and the date slipped to allow for additional time.

One major improvement resulting from our Financial Quality Control System is:

Employee Awareness.

When employees know their performance is being monitored against quality and quantity standards as the basis for periodic evaluations, they become more performance oriented. This results in increased productivity and quality. □



Document Processing with Automatic Update

Bambi, Bombs, and Birdwatchers

By CDR J. A. HAMILTON, USN

Remember how to play a game called "word association"? Someone says a word or phrase and then you say the first thing that comes to mind. Let's try it. First word — "birdwatcher." Does this bring to mind a stereotypical picture of a bookworm type, thick glasses, tattered reference book in hand, squinting intently with fanatical zeal through a spotting scope at some distant bit of feathered nonsense, the importance of which only he is aware?

How about the words "hunting," "fishing," or "picnic"? These probably remind you of various outdoor recreation activities.

One last word: "ordnance." Not "ordinance." Ordnance. An "ordinance" is something that tells you to keep your dog on a leash. Ordnance is ammunition. Things that go boom. Things that are manufactured and stored in remote locations under stringent security and safety restrictions at our ordnance and weapons stations. Things like bombs, missiles, projectiles, rockets, etc.

Review the list of words: birdwatcher, hunting, fishing, and picnic. What, if anything, do these words have in common with the last word on our list, ordnance?

Just this. All of our ordnance facilities (occupying hundreds and thousands of acres of public lands) are rich in natural resources and outdoor recreational opportunities: fish and wildlife, forests, scenic beauty, wetlands, and grasslands. These facilities are largely remnants of what the local areas were like a hundred years ago before extensive human encroachment.

The Navy has stewardship of almost five million acres of public land. When originally acquired, much of this property (particularly the ordnance facilities) was in rural areas.

As the country's population expanded, gobbling up large chunks of real estate, some formerly isolated ordnance facilities found themselves separated from the urban sprawl by only a chain-link fence. Outside the fence, shopping centers, super highways, and housing developments have taken their toll on the habitat. Wetlands are shrinking, and much of the native wildlife has disappeared.

Inside the fence it's a different story. Inherent ordnance safety and security regulations surrounding ordnance production and storage facilities require large areas where human activity is strictly controlled. This in turn means that these areas are, and will continue to remain, more or less in their natural state. These extensive tracts of relatively undeveloped land contain a large variety of wildlife and other renewable natural resources.

How are we managing these resources? How should we manage them? To answer these questions let's consider the commands and policies involved in both areas, ordnance and natural resources.

The Naval Sea Systems Command (NAVSEA) has the overall responsibility for policies regarding operations involving ammunition and explosives at naval shore stations (ammunition activities). These policies are mainly concerned with the supply of high-quality ammunition to satisfy fleet and Marine Corps requirements. Paramount considerations are given to personnel safety and responsibility. Thus the requirement for extensive uninhabited areas around ordnance manufacturing and storage areas.

OPNAV policy concerning natural resources management, under the broad responsibility of the Naval Facilities Engineering Command (NAVFAC), is as follows: "The Navy will maintain an integrated, multiple-use program for the renewable natural resources in forests and woodlands, fish and wildlife, soil, water, grasslands, outdoor recreation, landscaping, natural beauty, protection of endangered species, and preservation of cultural and historic properties in consonance with federal programs and compatible with the military mission."

Obviously, commanding officers are ultimately responsible for both OPNAV and NAVSEA policies, so given the above mentioned ordnance safety and security restrictions, is natural resources management compatible with ordnance management?

Yes it is! The last words of the OPNAV policy statement are "and compatible with the military mission." Conversely, do ordnance policies permit natural resources management in magazine areas? Yes!

A number of natural resources activities are permitted within explosive safety quantity distance (ESQD) arcs. A partial list would include: timber management, hunting, fishing, grazing and agricultural leasing, endangered species protection, and preservation of cultural and historic property.

For ordnance managers, natural resources activities within ESQD arcs are considered transient evolutions and are permitted at the discretion of the commanding officer. Waivers and exemption requests for this type activity are not required by NAVSEA.

What this means to ordnance and natural resources' managers alike is that consistent with security, safety, and common sense, the commanding officer can permit the above listed and related natural resources activities within ESQD arcs without asking special permission from NAVSEA. □

There are many benefits from a comprehensive natural resources program. Forest management supports the local economy with jobs and state timber taxes while providing a valuable product for the economy. Agricultural and grazing leases make productive use of grasslands that would otherwise be used for only a buffer zone around ammunition magazines. Monies from these leases offset grounds maintenance costs in many cases. Grounds maintenance (grass-cutting, fence repair, drainage ditches, etc.) does cost money.

Many stations include grounds maintenance clauses in agricultural and grazing leases. This is an effective way to cut overhead costs. If your station has this opportunity, it's worth pursuing. With the congressional axe poised above the military budget and elsewhere, future management decisions will require innovative steps to do more with less.

Hunting, fishing, and related activities afford valuable outdoor recreational options. Hunting also helps control over-population of game species, particularly deer. Left unchecked and with the absence of natural predators, deer will quickly overbrowse their habitat, impacting other wildlife species (and vehicles) as well as forest resources.

Multiple use management, consistent with the military mission, is DOD policy. To help realize the full potential of this policy, NAVFAC is staffed with biologists, foresters, soil/conservationists, landscape architects, and related professional. The can help you design and manage a natural resources plan that is compatible with your ordnance mission.

The annual DOD natural resources conservation award competition was initiated in 1962. In the ensuing years, only three Navy commands have won the top award. Two of these were ordnance facilities: NWS Yorktown, Va. (1965) and NAVUSEAWARENGSTA DET Indian Island, Wa. (1982). The other Navy winner was NAS Chase Field, Texas (1978). It's time we added more Navy commands to the winner's list. □

Planning: There's a better way to do it!

By RON YEATER
P. E., Ill.
Director, Installations Planning Division, NORTHDIV

Commencing with the consolidation of 13 small Engineering Field Divisions (EFDs) into six in 1970, the Installations Planning Division at all EFDs had essentially similar organizations. As early as 1973, Dick Moore felt that there was a better way of doing things and modified his organization during that period. Moore is from the Naval Facilities Engineering Command (NAVFAC), Atlantic Division (LANTDIV). I too felt that there must be a better way of carrying out the planning mission and when the opportunity arose in mid-1984 during a discussion with Cdr. Tal Bone, we embarked on a reorganization plan modeled after the LANTDIV arrangement.

At NAVFAC's Northern Division (NORTHDIV), we worked out the essential concepts of how we believed the Division should be organized to most efficiently and effectively carry out the facilities planning mission. Next came a discussion with our representatives and the classifier from the CCPO staff to explain our ideas to ascertain whether there were any holes in the concept and to avoid "shooting ourselves in the foot" from the supervisory ratio and grade classification standpoints.

Having received the thumbs-up from these first potential hurdles, Cdr. Bone then briefed appropriate planning and personnel staff at headquarters on the approach we wanted to take in the reorganization, and again no significant hurdles were placed in the way.

Headquarters' planners were in fact beginning at that time to think about the need for some kind of reorganization of the headquarters' level.

The next step was to gain the approval of the NORTHDIV Command offices and we were ready to begin the work of our reorganization plan.

Definition of Concept

Under the previous organization, we were concerned about implementation of the Shore Facilities Planning System for every one of our many activities, and for review and validation of projects submitted from any of them. Likewise, we had to be knowledgeable of every activity for the siting of facilities and for development of master plans, CIPs, and special planning studies.

Our concept was that these functions should be combined and that each of two branches would then have to be familiar with only about half of the total activities vice all of them. Each branch was to have two sections and, hence, a section would have to be familiar with only one-fourth of the total activities (or workload, as the case may be).

Secondly, it was our belief that activities of like nature should be assigned, insofar as practicable, to each of the four sections since like activities often have similar planning problems, and significant efficiencies would likely be gained by a particular section only having to be knowledgeable of certain governing criteria — i.e., AICUZ for air installations.

Finally, since each of the four sections would now be responsible for providing the total spectrum of planning services to assigned installations, it would be necessary to co-mingle requirements planners and master planners in each of the four sections to provide them with the capability and expertise to handle any planning situation encountered.

We were convinced also that this concept would enrich the jobs of all planners on the staff since eventually requirements planners would become completely familiar with master planning concepts and vice versa.

Additionally, the new concept would provide a single point of contact for planning matters for any installation, claimant, and other EFD components.

With the groundwork laid and the necessary approvals obtained, much work still remained. The first effort was to analyze the workload to ensure that each of the four planning sections was in balance with the others, both from the total workload and staffing as well as grade level perspectives.

A substantial amount of research into workload indicators was necessary to ensure that the required balance was obtained. Estimates were gathered on the number of manhours required to

perform all of the various functions with which any planning section would be tasked.

Among these tasks were master plan preparation, CIP updates, engineering evaluations, partial FRP updates, project validation reviews, 1,360 reviews, site approvals, consultation, PEA reviews, AICUZ and LUC chapter updates, special study requirements, CZM and historic determinations, etc.

All of the various estimates were then summed in relation to the first cut on activity assignments to each section, after which minor adjustments were made to the section assignments to bring total expected workload into balance insofar as practicable.

The next significant effort was to attempt to achieve a balance of requirements planners and master planners in each of the four sections to provide all-around capabilities to each section.

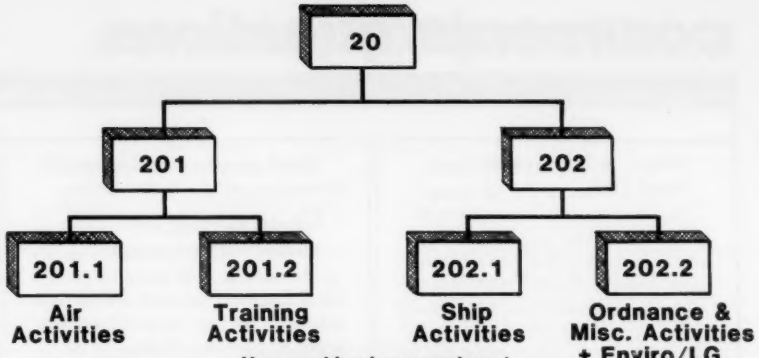
Part of the thinking here was to plug into each section personnel who had already gained experiences at some of the installations over which their particular section would have planning cognizance in the future.

This involved a major shuffling of people from one branch to the other to achieve the goal, and might have been a fairly traumatic experience for some individual planners as well as their supervisors.

Nevertheless, through open discussion and communications among the supervisory staff, an agreement was negotiated on who would relocate from one branch to the other to achieve the goal of balanced talent in each of the four planning sections.

Another major problem was how to transition workload that was already underway and might not be completed for several weeks or even months. All ongoing work and scheduled new starts had to be considered and decisions made as to whether the then existing cognizant branch would retain and complete the work or whether it should be passed immediately to the new cognizant branch, or whether pass-off should occur at some scheduled milestone downstream.

This was accomplished without serious trauma as a result of open discussions between the supervisory staff and some trade-off negotiations. Although it was anticipated that some things might get lost during the transition period which commenced Jan. 1, 1985, and that NORTHDIV would very likely



How workload was assigned.

experience a downward spike in production and goal accomplishment (an acceptable risk), this did not happen.

The transition period went smoothly with little lost production or diminution of goals accomplishment. This resulted from our preparations for the transition period, but most importantly, from the good attitudes and willingness of all the players to participate in an exciting new approach to facilities planning in NORTHDIV.

To attempt to explain these attitudes and willing participation, we need to look at the last major element of our reorganization plan. A number of meetings were held with the entire staff to explain exactly what we were trying to accomplish, to explain the milestones already achieved (approval steps, etc.), and to solicit the support of all hands in trying to make our operations better in the future.

We next set up a series of approximately 20 training sessions where unique aspects of requirements planning or master planning would be briefed by knowledgeable individuals to all planners not previously exposed or minimally exposed to the particular aspect to be briefed.

Essentially, requirements planners briefed master planners and master planners briefed requirements planners on the various details of what their jobs were all about. Training sessions were held on all those planning tasks identified earlier and more.

Through these cross-fertilization training sessions, every planner on the staff knew where he/she could obtain help or guidance on any problem not previously encountered. Extensive face-to-face discussions between planners did in fact take place during the early months of the transition period to familiarize each other with elements of the planning process which had previously been foreign to the individual.

In the process of familiarization with other concepts, the staff got to know other staff members on a much more personal basis, thus further unifying the division and creating a more conducive environment to get the job done.

Looking back one year after reorganization, the decision made by Cdr. Bone and myself about 18 months ago to reorganize was assessed. Was it the right choice? Are we better as a planning organization than before? Is the individuals' planning job more enriched and rewarding than pre-reorganization? Have the previous problems and conflicts between requirements planners and master planners been eliminated? Are the activities we serve satisfied with the approach we have taken? Would we do it again in retrospect? The answer to all of these questions is an emphatic yes!

The information presented here is meant primarily for the other Civil Engineering Corps and civilian planners in the NAVFAC family who are still operating as we all did (except LANTDIV) from 1970 to the present. It may also be of some use to other components of the EFD or other NAVFAC activities who have been contemplating reorganization as a means of improving operations.

For the planning community, if you have read the FY-86 OPLAN, you will note the following statement under Section 2.1.a. — "*Comprehensive Planning* — EFDs are to streamline comprehensive planning by establishing single planning teams to address both requirements and the physical aspects of planning." The long-awaited guidance from headquarters is finally at hand! □

comments/questions

More on honeycomb sand grid

Just a short note in response to LTJG Gatchalian and Mr. Chang's article regarding honeycomb sand grids (page 2, Spring 1986 issue). My command was heavily involved in the referenced 1985 amphibious exercise in Coronado, California, and had ample opportunity to watch the Marine engineers emplace and utilize the sand grid.

The system was installed easily and performed fully as advertised and as detailed in your article. This occurred even without the use of a rapid cure asphalt sealer on the top surface. However, what was not mentioned in the article was the painstaking, labor-intensive effort required to remove the sand grid from the beach at the completion of the exercise.

The plastic honeycomb construction does not have the strength to withstand being pulled up from the sand, and so it pulls apart in relatively small pieces as removal is attempted. It took one day for the Marines to remove the patch pictured on page 3 of the article, with the resulting plastic parts filling two dumpsters. Obviously, reuse of the sand grid is not recommended!

In a similar exercise planned for summer 1986 on Silver Strand Beach requiring construction of one mile of expedient road the Army has chosen MO-MAT over sand grid. The overwhelming factor for this selection was ease of recovery of the road surface at exercise completion.

The honeycomb sand grid is a good product with excellent potential for expedient construction. However, in today's peacetime climate where exercise participants are required to return the environment to its pre-exercise condition, it's important for planners and engineers to know "the rest of the story" before making material selections.

P. W. Marshall
Cdr., CEC, USN

Thank you for the additional information and for your interest.

Credit missing for author/organization

The Spring 1986 issue of *Navy Civil Engineer* contained an article entitled, "Divers Inspect Underwater in Elevated Tanks." The article was written by Mr. Wade F. Casey of the Ocean Engineering and Construction Project Office (FPO-1), Chesapeake Division (CHESDIV), Naval Facilities Engineering Command. Unfortunately, Mr. Casey's place of employment did not appear in the byline or anywhere in the article. This violates the apparent magazine policy to include the author's position and place of employment in the byline. In addition, several references to CHESDIV and FPO-1 were deleted during your editing of the submitted article.

One of the principal objectives in publishing this article was to let people know that we have developed a cost-effective way to inspect water tanks. The absence of any reference to CHESDIV or FPO-1 makes it impossible for the reader to easily obtain follow-up information.

We in FPO-1 are proud of our work in the important area of ocean and hyperbaric engineering and construction. I have enclosed a copy of our brochure in case you are not familiar with our work. When one of our people receive personal recognition for an innovative solution to a particular problem, expecially when it is applicable to non-ocean engineering situations, we all share in his success. It is somewhat demoralizing not to also receive the organizational recognition.

The editing of this article does not meet the standards of professional journalism we have come to expect of the *Navy Civil Engineer.*

A. M. Parisi
Cdr., CEC, USN

Thank you for your letter and comments. Please forgive us for editing out Wade Casey's reference to CHESNAVFACENGCOM FPO-1 and his later reference to FPO-1. We try to follow the instructions that govern our editorial actions — in this case, to omit references to acronyms and code numbers whenever possible. We took them out of Casey's article, and simply didn't realize that CHESDIV was not credited elsewhere, and consequently, did not add your full organizational name. Acronyms must be defined first when used.

It isn't "magazine policy" to include the author's place of employment under the byline, it is, however, editorial policy to do so. Contributing authors deserve it — they are our life blood.

Authors don't always include that information when submitting their articles, and we respect their wishes. Some don't even want a byline, but we try to discourage that too. Contact is made with authors, when possible, and the missing information is requested. If an author is adamant about not publishing position titles, employers, etc., we respect that position. Mr. Casey did not include this information.

Cartoons in Spring Issue offensive?

Oh you silly little editor, how can you be an editor of a engineering magazine, what do you know about engineering, you haven't a degree nor are you registered!

How do you feel after reading that? Pretty bad and maybe a bit mad — huh? Well, that is how I also feel after seeing the cartoon of a curvy woman officer, on the golf course, in uniform, in a stereotypical female pose, in the Spring issue. This subtle sexism or harassment is uncalled for and unprofessional, so knock it off. I am directing my comments to you, the editor, who

should be the person accountable for what is printed.

When I asked, "What is the most effective way to combat sexism or harassment?", to Cdr. Lucie, who is the Special Assistant to the Deputy Chief of Naval Operations for Women's Policy, she stated, "Demand and Command respect!" and that is what I have just done.

Now that I have made my point, I want to add that the technical content of the magazine is great and I am looking forward to receiving future issues, especially now, since they will be a little more sensitive to how they depict women.

Connie M. Madden
Lt., CEC, USN

A sincere thank you for your letter, your interest, comments and your compliment. After all, if we don't complain when we see evidence of sexism and harassment, how can we — you as a reader, and I as an editor — stop it? Cdr. Lucie is correct, we should "Demand and Command respect!"

I am offering my sincerest apologies to you — and to anyone else who found the cartoons in question offensive. We shall continue to endeavor to omit any future material that even hinges on being offensive. Regarding these cartoons, however, I would like to offer this information in my defense.

I find sexism, harassment, putdowns, slurs, slander, and degrading remarks or actions against women, men, ethnic groups, religions, and all the rest — unacceptable. As an editor, I learned to weed them out long ago. In the case of these cartoons, however, I personally didn't find them offensive. Also, they were approved by four people before they were published — four responsible, intelligent, sensitive professionals: the artist, a public affairs officer (female), and two naval officers. Since none of them objected, they were published. Perhaps all of us were wrong.

More on the cartoons . . .

Today . . . I was appalled and truly disappointed as I read Cdr. Conroy's article about "The Customer Expects Too Much." It was not the contents of his article that dismayed me, but the blatantly sexist graphics that accompany the article. They appear as if they may have been extracted from the historical files of the fifties or sixties. This is especially true of the cartoon on page 8, which appears to be a helpless female donning a female officer's cap. For what purpose she appears on a golf course in a civilian dress is extremely perplexing. Not only do I miss the point of the cartoon, but as a female officer in the Civil Engineer Corps, I am personally offended by its implications.

In a Navy, which prides itself of Equal Opportunity Employment and a work environment free from sexual discrimination, it is disheartening to me, to see that we must still contend with such sexist actions and even more disheartening to see that they are allowed to be published for the eyes of my fellow members of the Civil Engineer Corps as well as NAVFAC's civilian personnel.

I would greatly appreciate your attention to this matter and to ensuring that this type of objectionable stereotyping is avoided in the future.

S. L. Disher
Lt., CEC, USN

We are sorry you were offended. Please read the reply to the letter above. Added are these comments. I fail to see what it is that makes the female on the golf course, donning a female officer's cap, look "helpless." Isn't she simply standing there waiting her turn to putt the golf ball?

Perhaps the readers would like to write and offer their opinions of these cartoons?

Sometime, articles must be shortened

Thank you for publishing my article on Quality Circles in your latest issue of the CEC Magazine. I do have one small complaint, and that is that the technical guts of the article were surgically removed, I suppose due to problems with the size of the article. However, this leaves me a bit high and dry: you had previously published my letter-to-the-editor decrying the lack of technical information in CEC Magazine articles, and mine (as published) makes me look like a bloody hypocrite.

Could you please add a notice to your next issue that copies of the original manuscript are available from me (or you, if you so desire). I have enclosed a copy of the manuscript for your use.

Thank you. I hope to send another article soon.

N. B. Hall
LCdr., CEC, USN

I'm sorry to say, LCdr. Hall, that we did have to "surgically" omit part of your article because of space limitations. We tried, however, to omit what we believed to be the least missed, mainly — examples or "issues covered in recent quality circles," along with the humorous anecdotes (i.e., the elephant joke and the blind scholars).

Readers interested in receiving a copy of your article — unexpurgated — may receive one by calling or writing this office (see Contents page for address/phone). Omitted words or passages will be clearly marked, and other changes will be noted. Again, LCdr. Hall, our apologies and we are looking forward to receiving your next submission. Readers may also contact LCdr. Hall at MCB Camp S. D. Butler, Facilities Engineer/Public Works Branch, FPO Seattle, WA 98773.

Program for special project programming

By DR. JAMES L. SNYDER
P. E., Hawaii and Va.
and
DP3 DON W. WEAVER, USN
Naval Logistics Command
U.S. Pacific Fleet
Pearl Harbor, Hawaii

Special project programming needs to be dynamic and fluid. It basically involves spending money on facility deficiencies in an effort to do the most good for dollars spent. It depends on numerous variables and inputs, including:

- Activity Annual Inspection Summary (AIS) reports
- Conformance of activities in applying OPNAVINST 11010.34A for identifying nondeferable backlog
- Amount of nondeferable work identified command-wide
- Activity submission of special project summary listings and project documentation for individual projects
- Concentration on special interest items such as physical security, (CNO) high interest investment categories, Base Environmental Architectural Program (BEAP) projects, Type Commander (TYCOM) interest areas, etc.
- Available target (money)

The first step in programming special projects is to identify the activity level requirements. This is best accomplished by using the AIS in conjunction with activity summary lists. Activity AIS reports provide the nondeferable maintenance and repair (NMAR) backlog in the Deficiency Code 2 (DC2) category (above CO authority) and, by comparing all activity inputs win the TYCOM-wide total, each activity's fair share of target can be approximated.

For example, if an activity has a nondeferable DC2 backlog of $10 million and the total for all commands is $100 million, then that activity's fair share of TYCOM target would be 10 percent. Thus, the activity would receive approximately $3 million for special projects, based on a fiscal year target for the TYCOM of $30 mnillion. However, things are never this simple.

An activity may show a relatively high NMAR, but not have an adequate number of projects suitable for satisfying the deficiencies. The amount of target not programmable is thus available for reprogramming at other activities.

Many other intricacies and variations occur in programming and it would be extremely diffiuclt to try to develop a computer program taking into account all the myriad variations. However, a program has been developed which provides a starting point for special project programming. It was developed using dBASE II software on a Zenith 120 micro-computer.

Due to its length, it is not reproduced here but may be obtained by writing to Dr. James Snyder, Code N4911, Commander, Naval Logistics Command, U.S. Pacific Fleet, Pearl Harbor, HI 96860. Please include a self-addressed, stamped 8½" x11" mailing envelope. Arrangements can also be made to obtain the program on a diskette.

In an attempt to organize project variables into an orderly system, a spreadsheet format was adopted using the summary list layout as a guide.

Figure 1 shows a sample page of a portion of the project file developed for one activity's projects.

The format includes the activity name, program (actual/recommended) year, a TYCOM code, the station priority, project number, project title/description, investment category of the facility under consideration, current working cost estimate for the maintenance and repair portion, current working cost estimate for the minor construction/equipment installation portion, status of documentation (no documentation, Step I, Step II), deferability of the project, plans and specifications (design) authorization date, design completion date, bid opening date, construction fund date, ASN (more on this later), and a remarks column.

The TYCOM code provides an input for TYCOM priority. The A code is used for projects having a direct operational impact; B is for projects providing functional support; and C for projects which could be deferred and be substituted for by newly identified A or B projects.

The important features for programming are the TYCOM code, investment category, cost estimates, status of documentation, and deferability. Because there are so many potential

COMNAVLOGPAC RECOMMENDED SPECIAL PROJECT PROGRAM

ACTIVITY	YR	CD	SP	PROJ:NO	PROJ:TITLE	IC	CWE:MR	CWE:MC	ST	DF	PS:AUTH	PS:COMPL	ASN	REMARKS
* SUBTOTALS FOR ACTIVITY - NAVSTA XXX													0	NAF
NAVSTA XXX	85	B	11.0	C22-83	CONST ITT OFFICE	16	0.0	173.8	2		2/84	4/85E	0	PRIDE & PROFESSIONALISM
NAVSTA XXX	85	B	12.0	C8-85	GATE 6 & PED GATE 5A	18	0.0	163.0	2		2/85		0	
NAVSTA XXX	86	B	13.0	R7-83	RPR PERS REHAB FAC	16	86.9	0.0	2	N	1/84	1/85	0	WESTDIV REV 7-84
NAVSTA XXX	86	A	14.0	R27-83	RPR STRUCT/ROOF WHSE 279	12	621.5	0.0	2	N	3/84	1/85	0	
NAVSTA XXX	86	A	15.0	RCM10-84	RPR/ALT BRIG BLDG 58	16	816.4	181.1	2	N	7/84	9/85E	0	C-CO AUTH WESTDIV 10-84
NAVSTA XXX	86	B	16.0	R15-83	RPR ACADEMIC INSTR BLDG 88	05	165.0	0.0	2	N	7/84	8/85E	0	
NAVSTA XXX	86	B	18.0	R7-84	REPL ROOF/SIDING BLDG 78	05	739.7	0.0	2	N	7/84	8/85E	0	(PHASES I, II, III)
NAVSTA XXX	86	B	19.0	R20-84	RPR QW SHT PILING	03	1974.0	0.0	2	N			0	R-CO AUTH DC 4/85
NAVSTA XXX	86	C	20.0	C31-81	ALT/RPR BLDG 72	14	49.0	132.0	2	D1	4/83	1/85	0	POLLUTION ABATEMENT
NAVSTA XXX	86	B	21.0	C14-80	DIV OILY WASTE BLDG 3234	16	0.0	90.0	2		10/84	6/85E	0	NAVOSH
NAVSTA XXX	86	C	22.0	C7-83	EXIT LIGHTS BLDG 76	05	0.0	22.3	2				0	SURFPAC WESTDIV RE 8-84
NAVSTA XXX	86	B	23.0	C1-84	MOSU BARGE UTILITIES	17	0.0	47.7	2		8/84	9/85E	0	NAF
NAVSTA XXX	86	C	24.0	C20-82	LIGHTS BALLFIELDS 4 & 5	16	0.0	87.0	2		1/85	12/85E	0	NAF
NAVSTA XXX	86	B	25.0	RC10-83	RPR/ALT CCC BLDG 273	16	100.0	32.7	2	D1	1/85	12/85E	0	COMNAVSURFPAC
NAVSTA XXX	86	B	26.0	C9-85	MK18 PIER/PONTOON WALKWAY	03	0.0	180.0	2				0	NAF (EARLY FY-87)
NAVSTA XXX		C	28.0	C5-85	REL CONSOLIDATED PDC S.P	16	0.0	185.0	1				0	NAVOSH (OCR)
NAVSTA XXX		C	31.0	R3-84	REPL ASBESTOS BLDG 55 & 76	14	198.0	0.0	1	N			0	NAVOSH (OCR)
NAVSTA XXX		C	50.0	C9-84	EVAC ALARM/EXIT LITS 71	16	0.0	16.0	1				0	NAVOSH (OCR)
NAVSTA XXX		C	51.0	C7-84	FIRE PROTECTION BLDG 252	15	0.0	28.8	1				0	NAVOSH (OCR)
NAVSTA XXX		C	53.0	C54-83	EXIT LITS/SMOKE DET 78	12	0.0	64.0	1				0	NAVOSH (OCR)
NAVSTA XXX		C	54.0	C11-84	EVAC ALARM/EXIT LITS 221	16	0.0	15.0	1				0	NAVOSH (OCR)
NAVSTA XXX		C	55.0	C31-84	EXT FIRE ESCAPES BLDG 78	12	0.0	124.0	1				0	NAVOSH (OCR)
NAVSTA XXX		C	56.0	C12-84	EVAC ALARM EXIT LITS 58	16	0.0	23.0	1				0	NAVOSH (OCR)
NAVSTA XXX		B	57.0	C11-85	DEPERM FAC STOR BLDG	12	0.0	100.0	1				0	NAF
NAVSTA XXX		B	58.0	C28-83	FIRE PROTECTION CCC 3320	16	0.0	100.0	1				0	NAF
NAVSTA XXX		B	59.0	C57-83	FIRE SPRINKLER CCC 3320	16	0.0	50.0	1				0	NAF
NAVSTA XXX		C	107.0	C13-82	SHOWER FACILITY MGRC	16	0.0	25.0	1				0	NAF
NAVSTA XXX		C	108.0	C26-83	ADD VEHICLE PARKING MGRC	16	0.0	75.0	1				0	NAF
NAVSTA XXX		B	109.0	C15-82	REL PUMP STATION MGRC	18	0.0	143.0	2				0	NAF
NAVSTA XXX		C	110.0	C8-82	PAVE SERVICE ROAD MGRC	18	0.0	90.0	1				0	NAF
NAVSTA XXX		C	111.0	C23-83	VEHICLE STORAGE FACILITY	18	0.0	100.0	1					

FIGURE 1 - PROJECT LISTING FORMAT

Figure 1. Project listing format

COMNAVLOGPAC RECOMMENDED SPECIAL PROJECT PROGRAM

ACTIVITY	YR	CD	SP	PROJ:NO	PROJ:TITLE	IC	CWE:MR	CWE:MC	ST	DF	PS:AUTH	PS:COMPL	BO:DATE		ASN	REMARKS
* SUBTOTALS FOR ACTIVITY - NAVMAG AAA																
NAVMAG AAA		B	13.0	R1-85	REPAVE WAIKELE ROAD	18	195.0	0.0	2	N						
NAVMAG AAA		B	9.0	E5-82	REPLACE FIRE ALARM, WL	04	0.0	123.0	1				456	37	5	
NAVMAG AAA		C	28.0	R27-83	REPAVE PARKING AREAS	18	136.0	0.0	1	D3			454	0	8	
SUBTOTAL							331.0	123.0							61	
* SUBTOTALS FOR ACTIVITY - NAVSTA AAA																
NAVSTA AAA		B	23.0	R4-85	RPR HEAT SYS TRNG H-80/81	05	368.0	0.0	1	N			457	37		
NAVSTA AAA		B	15.0	C14.81	FIRE SPRINK BARRACKS 621	15	0.0	50.0	2	N			410	0	6	
SUBTOTAL							368.0	50.0							9	
* SUBTOTALS FOR ACTIVITY - NAVSTA ZZZ																
NAVSTA ZZZ		A	36.0	R19-84	STRUCTURAL REPRS WHARF M-1	03	490.0	0.0	2	N						
NAVSTA ZZZ		A	39.0	EC10-85	SECURITY IMPTS FICPAC 352	04	0.0	77.0	2	N					1	
NAVSTA ZZZ		A	51.1	R27-85	REPL DOLPHINS HALAWA A	03	217.0	0.0	2	N					1	PS
NAVSTA ZZZ		A	51.2	R35-85	REPL DOLPHINS HALAWA B	03	303.0	0.0	2	N					1	
NAVSTA ZZZ		A	73.0	C95-84	UPGRD SEC DOORS BRIG 220	16	0.0	108.4	2	N					1	
NAVSTA ZZZ		A	37.0	R99-84	REPR BOAT SLIP S375 F/I	03	148.0	0.0	2	N					1	PS
NAVSTA ZZZ		A	38.0	R14-85	REPR BOAT SLIP S376 F/I	03	151.0	0.0	2	N					2	
NAVSTA ZZZ		A	51.0	R96-84	STRUCTURAL REPRS WHARF M-2	03	500.6	0.0	2	N					2	
NAVSTA ZZZ		B	53.0	R89-84	REPRS NEX LAUNDRY BOIL 437	17	279.0	0.0	2	N					2	
NAVSTA ZZZ		B	43.0	RM47-83	PAINT/CARPET BEQ 1489	15	156.0	0.0	2	D1	4/84	9/84			2	
NAVSTA ZZZ		B	44.0	RM48-83	PAINT/CARPET BEQ 140	15	156.0	0.0	2	D1	4/84	9/84			4	
NAVSTA ZZZ		B	41.0	C59-78	FIRE SPRINKLERS QTRS 160	08	0.0	60.0	1	N					9	
NAVSTA ZZZ		B	54.0	C41-82	FIRE PARTXN BEQ 167 F/I	14	0.0	53.0	2	N			2522	204	9	
NAVSTA ZZZ		B	62.0	C82-83	DETENTION WINDOWS BRIG 220	16	0.0	62.9	2	N			2587	176	9	
SUBTOTAL							2401.3	362.7								

Figure 2. Sample output

combinations for these features, the need to identify an organized approach to looking at project files was understood early on.

A matrix was developed based on how these features varied. By assigning a whole number, in this case an ASN (a sequential number), to each case a prioritized model was developed, as shown in the table.

This matrix may be simply considered the "brain" of this program — it determines in what order individual projects should be reviewed for potential.

As a simple example, any project identified with a TYCOM Code of A automatically was assigned an ASN of 1. Because the program was designed to look at all files with low ASN numbers first, these projects are assured of being considered for programming as long as adequate target is available.

In order to take special interest items into account, such as physical security projects, the program was designed to assign an ASN of 1 to any project identified with a PS in the remarks column.

Because there are 18 different investment categories and there are different degrees of emphasis on different groups, three separate groupings were defined. Project documentation has three alternatives — 0, 1, and 2. Deferability of a project can be N, D1, D2, D3, or blank in the case of a minor construction project.

The development of the matrix assigning an ASN value dependent on these variables included the following logic. All projects having the TYCOM code of A are most important and should be considered for programming first, regardless of the status of projec. documentation, deferability, or investment category.

When the TYCOM code is B or C, however, these other variables become more important in deciding which projects should be reviewed first for potential programming. Within the respective TYCOM codes B and C, it was decided to emphasize those projects for which Step II documentation had been prepared prior to those with only Step I documentation or none.

Within each of these three documentation categories, nondeferable projects should be selected over those that are deferable. Similarly, projects designated D1 should be prioritized above those D2 and D3.

Finally, the matrix includes allowances for three groupings of investment category codes, in decreasing order of importance. That is, projects having an IC of 04, 06, 08, 09, 11, and 14 (IC3) are prioritized only after those having an IC of 01, 02, 03, 10, 12, 13, 15, 16, 17 (IC1) and of 05, 18 (IC2).

The matrix was designed in this manner based on CNO and major claimant areas of interest. Referring to the table, for example, a project having a TYCOM code of B, and investment category of 18 (part of IC2, second investment category grouping), a deferability of N, and Step 1 documentation available, would be assigned an ASN of 6.

Assuming all the above, but with the TYCOM code of C, the ASN would be 44.

The table indicates that equipment installation projects and minor construction projects are assigned indivi-

CD	ST	DF	IC1	IC2	IC3
A	ALL	ALL	1	1	1
IF REMARKS = (PS) OR (BEAP) THEN THE ASN = 1 (INCLUDES ALL IC #)					
CD	ST	DF	IC1	IC2	IC3
B	2	N	2	5	28
B	1	N	3	6	29
B	2	D1	4	7	30
B		*	8	N/A	N/A
B		**	9	N/A	N/A
B	1	D1	10	19	31
B	2	D2	11	20	32
B	1	D2	12	21	33
B	2	D3	13	22	34
B	1	D3	14	23	35
B	0	N	15	24	36
B	0	D1	16	25	37
B	0	D2	17	26	38
B	0	D3	18	27	39
CD	ST	DF	IC1	IC2	IC3
C	2	N	40	43	66
C	1	N	41	44	67
C	2	D1	42	45	68
C		*	46	N/A	N/A
C		**	47	N/A	N/A
C	1	D1	48	57	69
C	2	D2	49	58	70
C	1	D2	50	59	71
C	2	D3	51	60	72
C	1	D3	52	61	73
C	0	N	53	62	74
C	0	D1	54	63	75
C	0	D2	55	64	76
C	0	D3	56	65	77

NOTES

IC1 — Consists of the following IC #: 1, 2, 3, 10, 12, 13, 15, 16, 17

IC2 — Consists of the following IC #: 5, 18

IC3 — Consists of the following IC #: 4, 6, 7, 8, 9, 11, 14

* If project number is pure installation code (E)

** If project number is pure minor construction or has an installation code (E) and a minor construction code (C)

Table. Prioritized model

dual ASN values. This allows the program to potentially list projects in these two categories for programming before the minor construction target is depleted by combination projects, i.e., RMC, RC, etc.

Once the program examines each project in the file listing and the ASN values are assigned, a computer printout provides a project listing by ASN, lowest number first. By assigning an ASN of 0 to projects that need not be considered (such as those already programmed, NAVOSH, NAF, ETAP), these projects will be listed first, in station priority.

All other projects having the same ASN are likewise listed in station priority order. Thus, the program has so far reorganized the special project data base from a project listing in station priority to one which is much more useful from the programming aspect. Using this listing and the projected funding target for each activity, the programmer could proceed down the list and identify projects that should be selected in order of importance, based on the programming logic.

It would be even better if the activity targets were inserted in the program and the computer were set with the task of filling the maintenance and repair (M&R) as well as minor construction (MC) targets. This is exactly what the program shown in Figure 2 has been designed to do.

While the program basically adds up cost estimates until reaching a level within 3% of the target amount, there are special rules it needs to follow. For example, the cost estimate for equipment installation (E) projects is subtracted from the M&R target.

Figure 2 provides a sample output for a number of activities. For each activity, subtotals are provided for the cost estimate columns and the target values for M&R and MC are printed above the actual computer-generated programming totals (in the bid opening date and construction fund data columns). Comparing these values provides an indication of how close the program satisfied the targets each activity.

Finally, this program is meant to be a tool. It can only provide a starting point (straw-man); the special project programmer can use it as a basis to make more informed decisions in the overall programming process. □

advice of counsel

"He, who does not read history, is condemned to relive it."

By EVAN REVELLE

The need for a review of the immediate past is often appreciated at the time of job turnover or contract relief. However, my observation after more than 30 years with the Office of Counsel is that we are singularly inattentive to the long-range lessons of history as applied to contract administration.

One of these important lessons tells us that an extraordinarily effective method of paving the road to disaster in contract administration is to allow ourselves to be goaded into losing the even-handedness, essential to good contract administration and decision-making or as it more commonly is stated, to adapt the "cops and robbers" approach in our dealings with a contractor because of real or perceived provocations.

Consider this scenario. The contractor arrives at the preconstruction conference and after a minimum of pleasantries gives you a list of 12 deviations from the specifications for which he expects approval, he informs you that his CPM schedule shows completion of this 21-month contract in 12 months; that anything you do or fail to do which interferes with that plan, including your right to make changes, are failure to approve deviations, will be chargeable to the Navy as extended overhead, measured from the 12-month finish date.

He tells you that he will require a one-week turnaround time for shop drawings and you know that three weeks is your norm. He give you a list of ten clearly ambiguous areas of the specifications, which he has interpreted to his own economic advantage in his bid.

If your response to the contractor, as implemented in your contract administration is: "Your interpretation of the specifications is wrong — I will not approve any deviations or see if I can speed up my approval process — I'll take the project on the contract completion date in accordance with the plans and specs you bid on" you will have condemned yourself to playing catch-up contract administration from the outset.

After all it may be that some of the deviations are proper since we rarely draw up plans and specs from which no deviation may safely and validly be made. In addition a contractor has a right to finish early if he complies with the plans and specifications. Reasonable cooperation on turnaround time for shop drawings, if possible, benefits both contracting parties.

It seems to me that our duty as contract administrators is to address the contractor's statements and distinguish the legitimate request which we should investigate from the overreaching demand which we should respect based on sound rules of contract law. The early completion date should be subjected to scrutiny at the earliest and accepted, revised or rejected on the basis of achievability, not pique.

To reject all requests without such consideration will invite a series of claims on this and many other bases, some of which as outlines above, will be found legitimate or not probably incorrect, since we did not take the time to assess them against the facts existing at contract inception. Even more importantly you will be spending more time documenting and refuting claims than in getting the project completed.

The author, Evan Revelle, Deputy Counsel, NAVFACENGCOM, retired on September 3, 1986, after more than 30 years government service. Throughout his professional career Evan was intimately involved in the procurement process. His knowledge and experience in this area is extensive. In this article, Evan again provides the professional insight and good counsel his career has exemplified.

RAdm. Kidd Center under construction

Ground-breaking ceremonies have launched a new addition to the Navy Finance Center's Rear Admiral Isaac Campbell Kidd Consolidated Data Center in Bratenahl, Ohio.

An April 1987 completion date has been set for the $2.85 million addition, being constructed under supervision of the Northern Division of the Naval Facilities Engineering Command. According to Art Mathers, Public Affairs Officer, this new addition of reinforced concrete will match the existing structure and provide an additional 22,500 square feet of space. It will supply the extra space necessary to accommodate increased automatic data processing (ADP) equipment and administrative personnel.

The RAdm. Kidd Consolidated Data Center, dedicated in June 1974, is a one-of-a-kind facility in Navy electronic data processing, having been designed as a high-security facility dedicated to state-of-the-art ADP and telecommunications applications.

Future's bright for electric vehicles

Electric vehicles (EVs) have come a long way and if the technology and innovations continue to improve they should have a bright future. The Navy has an inventory of more than 200 EVs which are being tested at several locations throughout the United States and Bermuda, reports James C. Rumley, automotive transportation specialist at the Pacific Division (PACDIV), Naval Facilities Engineering Command at Pearl Harbor — one of the testing facilities.

In the three years since the PACDIV transportation division started testing six new EVs, technological innovations have advanced the state-of-the-art and EVs are now available commercially. Reliability is up and costs are down. Three years ago, performance was poor and resultant costs were high. Battery packs were supposed to last 15,000 to 20,000 miles, but failed after only about 3,000 miles. Battery pack explosions and post-meltdowns were not uncommon. But all that has changed.

Today's EV is capable of a 75-mile range between charges which is adequate when you consider that most vehicles, especially the Navy's, operate within the 75-mile range.

Navy gets four architectural awards

Field divisions of the Naval Facilities Engineering Command, headquartered in Alexandria, Va., received four 1986 Department of Defense Design Awards. The biennial awards, recognizing excellence in design of military construction projects, were presented during ceremonies at the Pentagon during this quarter year.

The Navy's winning projects were:

- For the medical facilities category, Medical Clinic, Naval Construction Battalion Center, Port Hueneme, Calif., designed by Bobrow/Thomas & Associates of Los Angeles, under the supervision of NAVFAC's Western Division in San Bruno, Calif.;
- For the large architectural facilities category, Defense Intelligence Analysis Center, Bolling Air Force Base, Washington, D.C., designed by Smith, Hinchman & Grylls of Detroit, Mich., under the supervision of NAVFAC's Chesapeake Division in Washington, D.C.;
- For the improvement projects category, Enlisted Dining Facility Modernization, Marine Corps Air-Ground Combat Center, Twenty-Nine Palms, Calif., designed by Lee & Sakahara Associates of Costa Mesa, Calif., under the supervision of NAVFAC's Western Division; and
- For the industrial facilities category, Underground Fuel Storage, Naval Air Station, Adak, Alaska, was designed by Tryck, Nyman & Hayes of Anchorage, under the supervision of NAVFAC's Western Division.

Chesapeake Division supports 'Statue' rededication

This summer's Statue of Liberty celebrations were supported by the Ocean Engineering & Construction Project Office of the Chesapeake Division of NAVFAC, by designing a mooring for the USS John F. Kennedy (CV-67). The mooring was to hold the vessel in place while the President, guests, and Navy personnel took part in the Statue's rededication and the International Naval Review.

Ocean platforms aid in pilot/aircrew training

Small stable semisubmersible platforms, moored at deep ocean sites, are essential to the development of advanced range facilities for the training of Navy combat pilots and aircrews. They will accommodate electronic instrumentation and antennas that relay data compiled during training exercises to shore installations.

In compliance with stringent federal noise pollution regulations, the Navy intends to locate future Tactical Aircrew Combat Training systems 50 to 60 miles off the East and West Coasts of the United States.

Toward that goal, the Naval Civil Engineering Laboratory (NCEL), Port Hueneme, Calif., has successfully installed the first large-scale model test platform in 2,910 feet of water off the Southern California coast. The platform has been identified as a suitable concept for range applications.

Dr. William Nordell, Director, Ocean Structures Division, said data being collected is the first data set ever produced for a small semisubmersible platform concept. The data set, in addition to satisfying NCEL goals, offers potential for research in the areas of drift forces, wind behavior over waves, and dynamic wind force effects on platform response.

situation report

Much interest has been expressed in so-called "open-end construction contracts" (properly referred to as indefinite delivery construction contract) as a means to cope with surge workload and manage backlog. Two variants are presently being evaluated in carefully selected field tests. The first type which has been under evaluation for over a year has been commonly referred to as a "multi-trades" contract. The contractor bids a labor rate by craft/trade and a material discount.

Hours and material requirements are negotiated against the bid rates and work is assigned by placing an order (DD 1155) against the contract. (Additional information on use of this type of contract is available from your EFD.) The second is a "job order contract." The contract specification includes a large number of specific line items of work (on the order of 25,000) with a price assigned to each item of work.

The contractor bids a coefficient (or discount) against the assigned price. Work is ordered by combining the line items required to complete the project and applying the bid coefficient to the price. (This system was developed by the Army.) The first Navy test solicitation is targeted for award this fall. Neither system is approved for full-scale field use at this time. However, they both show promise as tools for the future, and if successful, release for general use will be announced.

NAVFAC Planning, Code 20, has reorganized: The Facilities Planning Division (Code 200) now includes the old "requirements planning" (Code 201) and the master planners from the "installations planning" (Code 202) divisions. Special Advisors for Planning Coordination (Code 20Y) manage the AICUZ program, special environmental issues, historic preservation, intergovernmental planning, and encroachment issues. The Ops Research Consultant Group (Code 20Z) performs the systems analysis and special research provided by the former Code 203.

At NCEL, the Graphic Engineering and Mapping System/Pier Engineering System (GEMS-PIERS) publication has been delivered to the six NAVFAC Engineering Field Divisions (EFDs). Coauthored by NCEL and SOUTHDIV (Mr. Chip Steymeyer), the users' manual instructs planners and designers how to create berthing options and determine pier width and length.

It also incorporates specialized software for pier utility locations. A second edition of GEMS-PIERS, available this fall, will computerize DM's 26.4 and 26.6 environmental force calculations for seven ship classes. Contact Dr. Steve Gonzales, Code L53, NCEL, Port Hueneme, Calif., 93043. Telephone (805) 982-5043.

Random Sampling has proven to be an effective contract surveillance tool, providing the maximum information about a contractor's performance for the minimum expenditure of inspection time. Recent tests of the use of random sampling results for extrapolation of deductions on facility support contracts have proven highly successful.

Payments for contract work are in line with overall contractor performance, the receiving activity only pays for what it gets, inspection costs are minimized relative to contractor performance, and in tests, the program has seen contractors subject it to improve their performance significantly. The test results are being compiled into a revised system by NAVFAC Codes 10 and 022 and will be released to EFDs for field installation by fall 1986.

OPNAVINST 4860.7B calls for the government to "normally provide all prospective contractors with the opportunity to use government facilities and equipment involved in the performance of the CA undergoing cost comparison." Requiring the contractors to furnish their own equipment and facilities must have OPNAV (OP-443) approval. GFE/CFE choices also may arise in planning contract actions outside the CA arena.

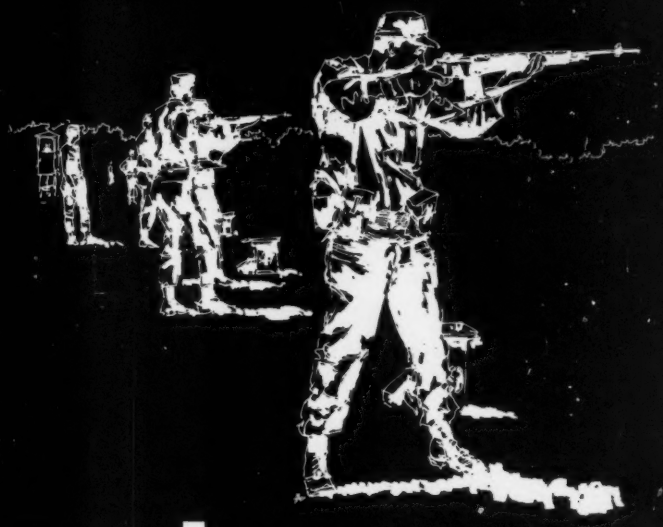
NAVFAC is developing a simplified cost analysis method, similar to the "Quick Sir" presently used for replacement MCON, that can be used as an aid in documenting the comparison and supporting a decision. The method should be available for field use by late summer 1986 and will be distributed to the EFD Code 10s.

The Naval Academy is the site of a relatively new method of pipe rehabilitation. In an effort to preserve the landscaping of the campus, the method of In-Situ Form pipe rehabilitation was used. In different areas of the campus, sewer lines had become badly cracked and the joints had been displaced thereby reducing the flow capacity.

The procedure basically involves using a felt-like liner which is heavily coated with a polyester resin. The liner is then forced into the existing pipe by water pressure. The material, which is heat-activated, is cured by flushing the pipe with hot water. Since the bond the liner forms with the sewer is mechanical rather than chemical, cracks and other irregularities are advantageous rather than harmful to the process.

The liner forms a very durable new pipe with a compressive strength of approximately 14,000 psi. Even though the liner reduces the diameter of the pipe, it generally increases the flow capacity by approximately 25 percent.

Seabees



We build — We fight

The number of articles received in response to the major theme for this issue, which is "Seabees," exceeded our expectations. Consequently, only part of them can be published in this issue due to space limitations. Those not appearing here, however, will appear in subsequent issues if possible. Please turn the page.

The art of anti-terrorist engineering

By LCDR JAMES W. THOMAS CEC, USN
Operations Officer, NMCB-74

It's a catchy title, but what does anti-terrorist engineering mean? Or maybe a better question is can "engineering principles" really be applied to a terrorist problem. Recently my battalion, NMCB-74, was a participant in an anti-terrorist exercise on Guam that was designed to increase the Navy's awareness and ability to cope with terrorist situations.

Generally speaking, the Seabees and the Navy have been ill-prepared to deal with terrorism. Practical experience with terrorism or broad-range exposure to its related problems is scarce. A couple of examples are presented of how the basic engineering approach to problem solving can apply to a very untypical problem, while sharing both some positive and negative experiences of NMCB-74's participation in the anti-terrorist exercise.

If you will remember back to Engineering 101, the first step in arriving at an engineering solution is to define a problem statement such as "we are expecting terrorists"; to find that a general solution such as "we'd better get some guards" or "we'd better find a safe place to hide" could be provided (of course hiding would normally be ruled out as not practical since resources or facilities could be left exposed).

After defining the problem, the next step is to break it down into more specific and detailed segments if possible (i.e., smaller problems) that are easier to solve. One of the better ideas or simple "engineering solutions" was arrived at in the base camp defensive plan by breaking a large problem down. Many of our Seabees were called on to defend a variety of assets outside of the camp.

The problem was how to help assure the camp itself did not give the appearance of a soft target with only a limited guard force. The big problem of "we are expecting terrorists" had been further broken down. The solution: Off-duty Seabees were required to remain in uniform when transiting the camp to give the appearance of more watch-standers than were actually present.

This unstealth technology has proven successful in naval engagements where ships' sizes and quantities were distorted on enemy radar scopes through electronic countermeasures. Our application of this proven tactic we viewed as successful since no serious attempt to penetrate our camp was made during the exercise even though we had been observed and even probed.

Failure can and often does occur in an "engineering solution" if the problem hasn't been properly defined; if too many variables are unknown; or if wrong assumptions are made. Assumptions and unknown variables can result from lack of experience or lack of adequate research. One of our responsibilities during the exercise was to set up road access control points.

The first attempt at this was one vehicle blocking half of a road with an armed guard beside it to stop oncoming traffic and check IDs. We found that for an armed or suicidal terrorist, this form of block provided very minimal deterrence and endangered our guard. Our solution essentially failed.

During the Revolutionary War the normally outnumbered American forces would hide behind trees while the British boldly marched forward in exposed ranks. I'm sure the British thought the Americans were not fighting fairly, yet the British failed to adjust and eventually lost the war to a force considered far inferior.

Today the terrorists are not fighting fairly by our standards, therefore adjustments to our normal operations are required. We applied our lessons learned (another engineering problem-solving phase) and after several more trials we arrived at a final "design" which worked well in the exercise.

We offset barricades (vehicles in most instances) in such a manner as to cause approaching vehicles to slow and dramatically change course. We made sure to block shoulders and surrounding ground so that the barriers could not be totally by-passed.

The barriers also provided a source of cover for our guards since exposing the guards would have been considered an automatic "kill" in any engagement. The barriers were placed such that a cable could be quickly stretched between them to totally deny access,

One sentry checks identification and the vehicle while the other sentry provides "cover."

Physically exposed security guards.

and two or more physically separated guards were always provided.

We experienced a similar evolution at our gates at Camp Covington where two of our gates were closed to all but emergency traffic. We had not provided adequate cover for our guards who were "eliminated" by terrorists while providing directions to a Marine. A second group of barriers was added and the replacement guards were physically separated and placed behind this cover.

If faced with a terrorist threat, it is possible to engineer defenses or actions to help safeguard assets. I call the engineering application an "art" because resources that can be devoted to this threat are limited; the most efficient use of them is purely subjective but like an art, how they are applied can be critical.

There is a tendency to try to force an existing solution to a new problem. Normal guard posts and fences can easily be penetrated and heavily manned defensive perimeters with extensive fortification can be costly and become target themselves, or at times rendered ineffective by deception.

When thinking through the terrorist problem, as with any unfamiliar problem, it is important to apply as many "knowns" as possible. Throwing distances, use of terrain, fields of vision, vehicle turning limitations, etc., are all familiar considerations that can be incorporated with normal military thinking into active and passive deterrence and defensive plans.

Until a broader base training plan and additional exposure and awareness occurs within the Navy and the Seabees, the "art of anti-terrorist engineering" will be necessary. □

Re-enforced guardpost was exposed to deceptive terrorist throwing a smoke bomb early in the exercise.

A historic deployment for NMCB-4

By LCDR SAMUEL S. WILLIAMS CEC, USN

The officers and men of Naval Mobile Construction Battalion Four (NMCB-4) will make Naval Construction Force history later this year when they deploy to the Navy's fifth and newest battalion deployment site — Sigonella, Italy.

The deployment by NMCB-4, scheduled to take place in November, will mark the first time a battalion's main body has gone to that European country.

A new site has been in the planning stage for the past few years. The Chief of Naval Operations announced the final decision earlier this year, selecting Sigonella as the fifth deployment site.

The operational need for a second deployed battalion in the European Theater and the strategic location of the Naval Air Station where the Seabee camp is located made Sigonella a logical choice. There is no other site in Europe large enough or available to accomodate a main body. There is also enough work at the Naval Air Station to keep the battalion productive during a deployment.

The Sigonella battalion compound, located in the middle of the Naval Air Station property, has been a large battalion detachment site for many years. Previously, detachments were sent from battalions deployed to Rota, Spain, and more recently from the main body site at Subic Bay, the Philippines.

With the decision to make Sigonella the fifth deployment site for Naval Construction Forces, COMCBLANT personnel intensified the planning necessary to ensure the camp was ready for NMCB-4. As anticipated, establishing a new battalion camp at a compound which previously housed a 190-man detachment posed many problems. Such as:

Table of Allowance (TOA) equipment. There will not be a complete allowance of equipment and tools at Sigonella for the NMCB-4 deployment. The Battalion will use augmented equipment and tools until warehouses are built for storing all its equipment.

Work spaces. The additional NMCB-4 manpower at Sigonella, although largely in the administrative area, will require new and enlarged facilities. NMCB-5 Detachment Sigonella is currently erecting eight new pre-engineered buildings to serve as office spaces and shops for the expanded workforce of NMCB-4.

Equipment, storage yard. With a larger workforce comes some additional equipment requirements. More storage space is needed. A temporary storage yard, probably located offbase, will provide enough space to park the augmented equipment and run a dispatch shop. The mechanics shop will remain at the existing compound.

Support services. Many of the support services a battalion would normally provide for their own men will be provided by the Naval Air Station. The major item was housing the 350-plus men for some seven months. Fortunately, NAS Sigonella can meet the battalion's berthing requirements. Other support services such as meals, medical and dental, personnel and disbursing will also be met by NAS personnel. NMCB-4 will provide people to help support these functions.

The majority of the camp expansion project will be complete before NMCB-4 deploys. NMCB-5 Detachment Sigonella is handling the bulk of the expansion project. Camp facilities will be almost complete; NMCB-4 will only have minor interior finish work to do on the new pre-engineered buildings.

In addition to the camp expansion project, NMCB-4 will also establish new detachments at La Maddalena, Italy, and Cairo, Egypt, as well as man the existing details at Naples, Souda Bay, Nea Makri, and Subic Bay.

Shelter selection aided by ABSEP

By LTJG DONALD H. GATCHALIAN, CEC, USN
P.E., Calif.
Naval Civil Engineering Laboratory
Port Hueneme, Calif.

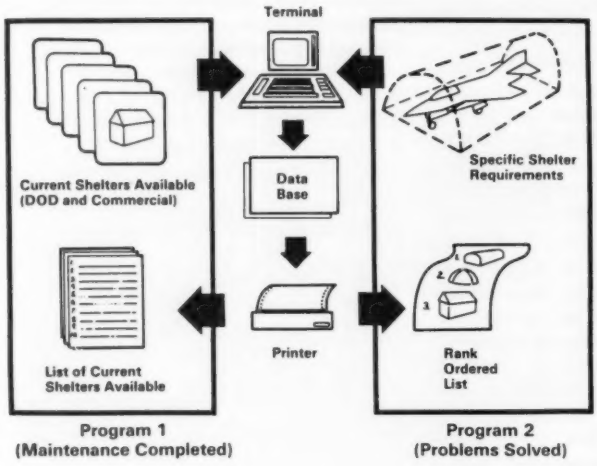
Months before a battalion of approximately 750 Seabees is deployed overseas, the complex battle of logistics already has begun. Movements of personnel, supplies, equipment, and machinery were orchestrated and executed according to a complicated time table of arrival and installation.

One of the major (and often minimized) logistical burdens involves the procurement and construction of proper semi-permanent shelters, vital to a successful deployment. If the Seabees were to construct an advanced bare-based camp, they would need at least 40 shelters, each demanding singular built-in requirements (attributes) such as size, ventilation, heating, snow and wind loads, cost estimates, and earthquake resistance fortifications.

The Navy describes a shelter as a relocatable and disposable structure, ranging in size from 20x40 feet to 120x140 feet. The procurement of function-related shelters in a timely manner has been a constant and costly problem. The Navy lacked the capability to select the best available, qualified shelter for a given functional requirement. It needed a single reliable source of information on shelter availability and selectivity, based on specific requirements and geographic limitations.

A system of predesigned shelters does exist but many sources of shelter information must be reviewed before a limited, and often inadequate, selection is made.

The solution? It's the recently-developed Advanced Base Shelter Evaluation Program (ABSEP), designed by the Naval Civil Engineering Laboratory, Port Hueneme, Calif., for the Naval Facilities Engineering Command (NAVFAC). The system has been designed primarily for the Civil Engineer Support Office (CESO), Port Hueneme, but is available to other military services upon request.



Advanced Base Shelter Evaluation Program (ABSEP)

For example, if the Seabees want to erect a 40x80 foot hardwall structure with three doors, four windows, specific safety factors, unique seismic and snow loads, and water and disposal units, their procurement officer can call upon ABSEP.

The program features three components: computer program, user guide, and data base. The design, three years in the making, has been completed. Already more than 100 different types of shelters (all of the available commercial, Navy, and other Department of Defense structures) have been included in the program. System managers and developers also can obtain current shelter research and development data.

ABSEP is intended for systems and RDT&E managers, as well, to determine and prepare shelter proposals when none of the existing shelters qualify for advanced base specifications.

The computer program phase of ABSEP consists of a series of main programs interfacing with the data base. Presently, two programs are operational; others can be added when required. Program One recalls the data base by simply reprinting lists of shelters. Program Two, drawing information from the data base, evaluates shelters for any given functional requirement (collective performance and costs to satisfy a particular need). The program can disqualify shelters or rank them in order of preference.

Program Two's mathematical model consists of multi-dimensional utility theory to analyze benefit/cost and determine the best available alternative shelters. Input data will consist of a requirement and a figure of merit for each attribute. The user can directly input shelter performance and cost data or they can be called from the data base, or both.

Normally, output will consist of a list of qualified shelters in rank order. However, when no alternatives qualify, sensitivity analyses will cite the shortfall, assess its severity, and recommend an alternative shelter for improvement.

ABSEP features 54 attributes, 43 pertain to benefits, and the remaining 11 concern costs. The user selects the attributes by assigning them figures of merit (1 to 10). Others are eliminated by assigning them a zero figure of merit. The user must include at least one benefit parameter and one cost parameter.

The data base consists of all shelter performance and cost data, maintained as a reference library of alternative solutions. Data are separated into four parts: (1) validated data; resulting from testing or experience; (2) catalog data, or unvalidated claims; (3) developmental data which are unvalidated objectives; and (4) temporary data which may include proposals. The data base and computer programs are located physically at a contractor facility.

A shelter identification number provides discrete identification of each shelter in the ABSEP data base, including the user activity that assigned the number and the classification of the shelter. Users have access to all data in the central data base but the users can change only their own data.

ABSEP features the following general capabilities: (1) unlimited number of users (by subscription), (2) compatibility with most microcomputers that have a modem or other telecommunications link, (3) execution by conversational mode (user friendly), (4) inclusion of virtually all types of advanced base shelters, (5) user options, (6) user guide and central data base, (7) labeling of data to identify originating user, (8) security system to protect data, and (9) data base compatibility with any number of main programs.

Program Two accepts and applies the user's figures of merit to the selection procedure and to the sensitivity analysis. This tailors the evaluation to the user's preferences, priorities, and policies.

The users must have a terminal, a modem or acoustic coupler, and a telephone line. A printer is a recommended optional item. No special software is required. All software is located at the central facility. To sign on, the users need an activity number and an ABSEP subscription. They don't need any disk, card, or tape input.

Procedures are prompted on the monitor to minimize reference to the user guide. Output is labeled to decrease interpretation.

ABSEP has been completed and has demonstrated its capabilities during tests using Advanced Base Functional Components (ABFC) system requirements.

For additional information, contact the Program Management Office, L60PM, Amphibious & Advanced Base Department, Naval Civil Engineering Laboratory, (805) 982-4660. □

RNCF = Training, sacrifice, and dedication

By JOC DON RAY
COMRNCF
Greensboro, N.C.

In World War II, Korea, Lebanon, and Vietnam, it was the Seabees, active duty and reserve, who built the airfields, fuel depots, docking facilities, roads, and much more.

Active and reserve Seabees slept, ate, fought, and worked side by side, proving to the enemy that Seabees were number one.

Quoting General MacArthur, "The only trouble with the Seabees is that we don't have enough of them." General MacArthur's point was proven time and time again during the Korean War and in Vietnam. In both cases reserve Seabees were recalled to active duty.

Where did they come from? They were the veterans and sons of veterans from World War II who had affiliated in the Reserve Seabee Program following the war. These veterans and their sons made up the first reserve Seabee divisions in the late 1940s and '50s. It wasn't until June 1960 that the Chief of Naval Operations authorized the establishment of Reserve Naval Construction Battalions and seven years later, the Reserve Naval Construction Regiments.

The Reserve Seabee Program continued to grow and the need for unification was obvious. The creation of the First Reserve Naval Construction Brigade in September 1969, created a command billet for a reserve CEC flag officer. Rear Admiral George Reider, CEC, USNR-R, was the first to command the First Reserve Naval Construction Brigade. Manpower, equipment, facilities, and budgets improved over the years. Permanent drill sites were established for each battalion. Equipment began to arrive for assignment to reserve battalions. Overseas deployments were initiated for reserve Seabees. Also, new units were established, bringing more growth to the Reserve Seabee Program.

In 1972, Commander, Naval Reserve Force, then entitled Commander, Naval Reserve Training, issued an instruction stating the Commander, First Reserve Naval Construction Brigade, would also become the Commander of the Reserve Naval Construction Force. The reserve Seabees then came under the direct operational control of the COMRNCF/1STRNCB, instead of the Naval District Commandants.

Despite fiscal constraints in the mid-1970s, this period of history furnished the RNCF/1STRNCB with opportunities to refine ongoing programs and initiate new precepts of training for the ultimate goal of "mobilization readiness."

Air Detachments (Air Dets) in each battalion were established and exercised under the "mirror image" concept with the actives. Today, four reserve Seabee Air Det flyaways, known as "Green Stinger" exercises in the reserve Seabee community, are conducted annually, testing the military and professional training of the battalions.

The Facilities Engineering Program (FEP) and the Commander in Chief U.S. Naval Force Europe, Deputy Chief of Staff for Construction Management (CINCUSNAVEUR DCOS/CM) became part of the RNCF on October 1, 1981. One year later, FEP became Reserve Division, Naval Facilities Engineering Command (RDNAVFAC) and CINCUSNAVEUR elevated the DCOS/CM billet to Assistant Chief of Staff for Construction Management (ACOS/CM). The goals of the reorganization were to geographically realign detachments closer to permanent drill sites, creating a better battalion balance. By now, the RNCF billets totaled approximately 16,000.

An Air Force Loadmaster directs offloading operation of RNMCB-20 vehicle during the battalion's Air Det at Camp Atterbury, Indiana.

The Reserve Seabees use two of many weapons to hone their military skills, the M-16 . . .

and the Mark 29 81-mm mortar.

Whenever possible, the COMRNCFs seized every opportunity available for the Reserve Seabee Force to hone their military and professional skills.

In August 1983, a new mission element was developed for the COMRNCF — the Construction Battalion Hospital Unit (CBHU). In one week it grew from a visionary concept to a fully developed program with 2,000 new reserve Seabee billets. The Seabees were given responsibility for assembling and maintaining modular, containerized fleet hospitals that would be prepositioned for use in war or other emergencies.

Fifteen such hospitals are planned for the Naval Reserve; eight for active duty forces. The first of 15 CBHUs was established at Forest Park, Illinois, in September 1983. Rear Admiral William D. Daniels, then Deputy Chief of Naval Reserve, said at the ceremony, "This project has a very high priority and . . . the others will be established as soon as practical." Fourteen CBHU's are on line today. The project is targeted for full operability in 1988.

The RNCF Today

Today's RNCF continues to move forward steadily. Statistics show that the reserve Seabees provide millions of dollars of construction value annually to activities which directly support the fleet. Many of the projects are aimed at improving the quality of life for Navy personnel as well as providing essential construction of operational facilities. The many civic action projects completed by reserve Seabee detachments have saved thousands of dollars for cities and towns across the country.

Rear Admiral Charles R. Smith, CEC, USNR-R, is the present commander and the eighth flag officer to command the RNCF. One week following his assumption of command on September 29, 1985, RAdm. Smith met with his full staff, active duty and selected reservists in Greensboro, North Carolina, headquarters of the RNCF. RAdm. Smith expressed his views, objectives, and the direction the RNCF and its people would head for the next two years. In the first ten months under his command, the RNCF has been a moving force.

An important topic which has received a great deal of attention is mobilization. The RNCF has increased its involvement in mobilization planning, plus has assisted NAVFAC with mobilization workshops. The RNCF's readiness and mobilization reporting has improved. Complete TA-41s, the Air Det's Table of Allowance, were purchased and delivered to every reserve battalion, 17 in all. Two additional TA-41s, one for each of the reserve battalions commissioned in September 1986, RNMCB-6 in Fort Jackson, South Carolina, and RNMCB-53 in Granite City, Illinois, are being processed by CBC Gulfport.

Other areas receiving RAdm. Smith's attention are the Sea and Air Mariner Program, automated data processing equipment, increased training opportunities and retention in the force.

Today's Reserve Naval Construction Force, with 18,000 reservists and 200 active-duty personnel, is a well-trained and highly professional command. Making up 18 percent of the selected reserve and 70 percent of the Navy's total construction force, it has the manpower and the expertise to respond quickly and effectively.

The Reserve Naval Construction Force encompasses many things . . . people and hardware . . . training and organization . . . sacrifice and dedication. The strength of the force lies in the patriotism of the individual drilling reservist. Like those who have worn the Seabee greens before, today's Seabee reservist responds to challenges with an attitude characterized by the traditional Seabee motto — "Can Do." □

New container system introduced

By J. R. McCULLY

In the form of mount-out boxes, and later, container express (conex) boxes, the Naval Construction Force has been a user of container systems for moving cargo for many years. A forerunner of the modern International Standardization Organization (ISO) container was a reusable steel container measuring 8-ft x 6-ft x 7-ft.

The conex system was developed by the Department of Defense in the early fifties to reduce damage to and loss and pilferage of household goods. The system was a success. By the mid-fifties, a regular shipping program was in operation for other troop support cargo. The military owned approximately 100,000 conex boxes.

Also in the mid-fifties, commercial ocean carriers began to develop the intermodal container system as we know it today. During the Vietnam conflict a contractor-operated container system was established that proved highly successful in a war environment.

Now there is a new Seabee container system. The Seabees will use two basic sizes of containers to store and ship their Table of Allowance (TOA) material: the standard 8-ft x 20-ft type and the 8-ft x 8-ft x 6-ft, 8-in tricon.

The containers will be of two types: configured and bulk. The configured containers will have cabinets with drawers and shelves. The drawers will have adjustable partitions or dividers for storage and issuance of small items. The aisle of the configured containers will be used as shipping space for such

items as tents, tool boxes, and so on. Once the items in the aisle have been removed, the container will be ready for its warehouse/storeroom/issue point function.

The Seabee container system will allow the NCF unit material to be transported on modern container ships. Containers also will enhance readiness for mobilization. The majority of tools, repair parts, and so on, will be ready to move. It is much easier to locate, load, and move fewer than 100 containers for each battalion than it is to palletize approximately 1,600 2-ft x 2-ft x 4-ft plywood mount-out boxes.

A contract was awarded in May 1986 for the first increment of containers for the Seabees. The first delivery is scheduled for December 1986. The initial contract will provide 20-ft containers for 11 active and reserve construction battalions. The contract will also completely outfit all battalions with the tricons.

The equipment allowance has been revised to ensure that the Seabee units will be able to handle containers. The 20-ft container can be loaded and off-loaded using any of the cranes in the NCF units equipped wih a top-lifting device. The air echelon will include two air-transportable cranes capable of loading and unloading the 20-ft containers. The tricons can be loaded and off-loaded with the 10,000- to 12,000-lb forklifts that are in the allowance. The tricons and the forklifts are air transportable.

The containers can be transported on the battalion's stake trucks. This does not mean that the battalion can load up and move overland in one trip with its organic equipment, but it will allow the unit to move with fewer trucks and fewer trips than are required under the present system.

We are presently reviewing a method whereby wheels with built-in jacks may be attached to the containers to allow them to be rolled into a warehouse. This would be of benefit at the permanent deployment sites. The device is also capable of raising the container off the bed of a truck, or from ground to truck-bed level. Then the truck may be driven under, or from under, the container. This method will be of great benefit when there are only a few containers to be loaded or off-loaded.

You can be sure that when the Seabees begin using the containers on deployment there will be many innovative uses that we have not presently considered. This is great and is part of what makes the Seabees the "can-do" units they are. But we must remember what the containers are for: shipping, storage, and issue points. So don't let the innovative uses destroy the weather tightness or overall outside dimensions. □

Seabee teams like small "Peace Corps"

By LTJG JAMES R. VAN DE VOORDE
WITH JO1 WALTER A. REKOSKI

When Seabees from Civic Action Team (CAT) 0423 boarded an airplane for their long-awaited flight home following an eight-month deployment, they carried fond memories of a successful deployment. CAT 0423 was comprised of 13 Seabees from NMCB-4 and represented almost all construction trades.

Some will reminisce about the many "small-scale" construction projects they worked on while deployed to the Republic of Palau, a remote island nation in the southwestern corner of the Trust Territory of the Pacific Islands.

Others will cherish experiences gained from training young Palauan nationals in construction fields. But in years to come, all will remember the deep abiding appeal of the people they had come to know.

"Seabee Teams have been called the Navy's Peace Corps. But we just prefer to call ourselves the Navy's Seabees and leave it at that," said Ltjg. Van de Voorde, the team's officer-in-charge.

"In a lot of ways, we're trying to accomplish some of the same objectives (as the Peace Corps) in that we are trying to help the people of Palau. I think we have a definite advantage, however, because of our discipline and the way we're organized to accomplish a mission," he added.

The present-day CAT teams are very similar in composition to Seabee Technical Assistance Teams which emerged in the early '60s and were deployed to Southeast Asia. The team concept grew from tradition of small groups of Seabees responding to emergency requests.

They were introduced to Micronesia in 1969 when a detachment of the Naval Construction Battalions, U.S. Pacific Fleet (COMCBPAC) was established in Guam, and six Seabee teams deployed to the area.

The Army and Air Force later added teams, now referred to as Civic Action Teams, and the Civic Action Program in Micronesia evolved into its present form. Today, there are two Navy teams, deployed to Palau and Yap; two Army teams at Ponape and Kosrae' and one Air Force team at Truk.

While CAT teams provide no direct support to the U.S. Navy's fleet, their mission enhances the image of the U.S. military, aids the host nation's socioeconomic development and provides limited medical assistance. In support of these objectives, CAT teams complete small-scale construction projects. The materials for these projects are supplied by the host government or the customer.

"The coordination of our projects on Palau was done at a very low level, and it usually got down to the point where I talked with a village chief who wanted a road built or a parks and recreation official who wanted us to help with the maintenance of a ballfield," Ltjg. Van de Voorde added.

The Civic Action Coordinating Committee at Palau is made up of local government members, including public works officials and state representatives, and meets monthly to prioritize work and approve projects to be completed by the resident CAT team.

During their 1985-1986 deployment, NMCB-4's CAT team completed seven projects for the Palauan people and an additional four within the Seabee camp they affectionatley called Katuu, which means CAT in native Palauan language.

The projects included resurfacing of roads, reconstructing a grammar school ballfield, dredging operations, reroofing a high school, and constructing a 12-foot chain link fence around a high school tennis court.

Hospital Corpsman First Class Gaylord Drake, a member of the team was responsible for the general health of team mem-

bers. He also saw over 300 native patients each month at his clinic. HM1 Drake also made medical assist visits to outer areas of Palau.

The key to the success of the CAT team program was NMCB-4's training of Palauan nationals. They were given on-the-job and classroom training in the builder, equipment operator, and construction mechanic fields. Once they became proficient, individual members were graduated at formal ceremonies.

Throughout the deployment, team members were not only active in the community because of their construction projects, but also because of their off-duty volunteer work. They regularly showed movies in camp and participated in many local events and holiday celebrations.

The best evidence of this was during the recent inauguration of President Lazarus E. Salii and Vice President Thomas O. Remengesav.

"We provided everything for the inauguration, from building a stage and grading roads to helping with the island's Operation Facelift, which was a thorough cleanup of the city," said Ltjg. Van de Voorde.

The hospitality of the Palauan people equally matched the Seabee's "can-do" spirit and will not be forgotten by team members. "They'll gladly give you anything they hold dear and they'll give it as a token of their appreciation. That's what's really nice about these people," Van de Voorde concluded. □

SAMM: Computers for the Seabees

CHARLES W. BRASFEILD, JR.
Commander (Select), CEC, USNR
Project Manager, SAMM System

NAVFACENGCOM

The largest unit in the Seabees, the Naval Mobile Construction Battalion (NMCB), can be easily compared to its counterparts in the private sector — the self-sustaining, overseas operations of large construction corporations. The obvious exception is that the Seabees are capable of fighting to defend their construction projects in hostile environments.

As automation and computerization began to be utilized by the construction industry, computer applications were considered for the Seabees as well. With 600 men and a Table of Allowance (TOA) exceeding $19M, a typical NMCB completes approximately $18M equivalent contract work in place during one year. This formidable task must be accomplished while maintaining full military readiness.

Since the Naval Construction Force (NCF) is responsible for constructing, operating, and maintaining shore, inshore, and deep ocean facilities in support of military operations in contingency situations, it becomes easy to see how utilization of microcomputer technology could enhance the execution of the Seabee mission.

In 1977, approval was obtained to acquire nine minicomputers for the Seabees. These computers were installed in peacetime deployment sites and were mainly used for management support of construction, personnel, equipment, and project material. While useful, these minicomputers

Figure 1. Z248 system has three principal components.

were bulky, expensive, and not sufficiently mobile enough to support Seabee operations during a contingency where it would really matter.

In 1981, COMCBPAC and COMCBLANT requested a study be made concerning the future role of computers in the Naval Construction Force. This study coincided with the computer industry's development of smaller, more rugged computers and associated hardware. Independent studies were conducted by Cdr. Don MacKinnon, CEC, USN, and LCdr. Gary Wegener, CEC, USN, which determined the need for computers in the Seabees, and cited the special need for computer configurations that would support Seabee operations during hostile actions and peacetime training missions.

In 1983, a Mission Elements Need Statement (MENS) was drawn up and approved by the Chief of Naval Operations. A project management charter was prepared, and NAVFAC's Deputy Commander for Military Readiness (Seabees) was assigned as functional manager, all which preceded the full development of the desired hardware.

The Seabee Automated Mobile Management (SAMM) System was named by Cdr. Mike Johnson, CEC, USN, who became its first Project Manager. During the development of this brand new program he had been the NCF's planning and programming officer. The continued development of the SAMM System has been primarily the responsibility of the Civil Engineer Support Office, under the direction of NAVFACENGCOM, but frequent input from Seabee field units ensures that the final product will fulfill mission needs.

During the initial planning stages, a briefcase-sized computer of minimal weight and high transportability was thought to be the ideal piece of hardware for the Seabees. That idea manifested itself into a requirement for an IBM PC-compatible computer using an INTEL 8088 microchip processor with capabilities for expansion, flexible disk drives (floppy diskettes — 5¼"), a fixed disk drive (or hard disk drive for megamemory), and a 15-inch letter-quality printer, all backed up by a battery system.

As various tasks were added to the computer, system requirements quickly outpaced the capabilities of any briefcase-type machines then available or in development. Also, through coordination with other agencies, such as the Marine Corps Logistics Command and the Army's Project Manager for Unit Level Computers (ULC), it was deter-

mined that briefcase-size computers were definitely inadequate to any field unit's microcomputer needs.

However, with the development of portable IBM PC/AT-compatible computers using the new 80826 microchip processors, off-the shelf hardware was now available to fulfill the Seabee's operational requirements.

It will work like this. The SAMM System will provide an automated system that will help all Seabee units manage personnel, material, and equipment more effectively in the execution of their assigned construction mission. The SAMM System will provide an excellent planning tool for mobilization and will assist in rapid development of embarkation plans.

Significant increases in productivity are expected in labor-intensive administrative and planning tasks. Through the use of custom software, improved individual training plans will become routine. Both active and reserve components of the NCF are expected to gain significantly in readiness capability and the ability to mobilize rapidly and successfully.

SAMM System hardware will consist of two different computers with compatible operating systems. The first hardware is scheduled to be distributed in FY 1987. It will consist of Zenith Z-248 computers procured from the Air Force-Navy microcomputer contract. The Z-248 is an IBM PC/AT-compatible microcomputer with one 360K flexible disk drive, a 20 Mb hard-disk drive, 10 expansion slots, an 80286 8MHz central processing unit with 640K Random Access Memory (RAM). It will have the standard MS-DOS 3.1 operating system. The system's weight is approximately 65 pounds, including monitor.

As illustrated in Figure 1, it consists of three principal components: the central processor unit with disk drives, the keyboard, and the monochrome monitor. A letter-quality dot matrix printer will be provided with each computer. Software will be provided with each computer with capabilities of handling project management, word processing, data base management, spreadsheet, graphics, and other miscellaneous applications. Hard-sided, internally-padded shipping containers will be supplied to deploying units with each desk-top computer.

For applications requiring a higher degree of transportability, a more compact, lighter, one-piece computer will eventually be purchased to supplement the Z-248s. This portable computer will have a high-resolution 9-inch, cathode-ray-tube display, an IBM PC/AT-style keyboard, a 1.2 Mb flexible diskette drive, a shock-mounted 30 Mb fixed disk drive, RAM of 640K, and four expansion slots.

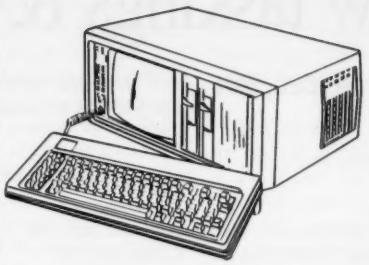


Figure 2. Portable computer with 640K memory.

With its padded nylon carrying case, its small size (9″ x 20″ x 16″), and its weight of just under 35 pounds, it will be easily transported. Initial deployment of these models is planned for FY 1988. Figure 2 depicts the portable computer.

All unit computers will be supplied with a standard software package consisting of a word processor, a spreadsheet, a data base manager, a graphics board, and utility programs. Custom software for applications unique to the Seabees is under development. A total of more than 35 such applications are planned during the next three years.

In support of supply and logistics, integrated software packages are planned for OPTAR and travel accounting, disbursing, equipment repair parts, material liaison office, central stock room, central tool room, greens issue, food services, and integrated logistics overhaul. Construction operations will be supported with software to assist construction management, bills of material, and blueprint inventory.

Administration support will include personnel management, medical / dental, and publications inventory. To schedule training, software will include a ''plan for the man'' homeport training scheduler. Air embarkation will be aided by the Air Force Cargo Aircraft Load Manifest program.

Once completed, a Marine Corps developed, ship-loading software package will be utilized by the Naval Construction Force. Various Seabee units will be requested to test prototype software which will then be issued to all units as it is completed.

Computer hardware, software, and support equipment will be placed in the TOA for each Seabee unit. Table 1 shows the numbers of each type of computer which will be issued to various Seabee units. The schedule will vary from unit to unit, but most units will receive Z-248s during FY 1987 and all computer issues should be completed by the end of FY 1989. Long-range plans include local area networking, telecommunications, and use of compact laser disc technology to distribute data base information to the users.

COMMAND TYPE	SYSTEMS FOR EACH COMMAND	
	DESKTOPS	PORTABLES
CBPAC	4	1
CBLANT	4	1
NCR	17	16
NMCB	7	14
PHIBCB	11	14
CBMU	0	2
CBU	2	0
UCT	1	2
COMRNCF	4	1
RDVAVFAC	2	0
RNCFSU	4	1
RNCR(HP)	4	1
RNCR(OP)	4	1
RNMCB	6	3
NCTC	24	5
CECOS	6	0
NAVFAC	4	2
CESO	6	2

Distribution of SAMM computers.

ACBs — New taskings & bright future

By LCDR EVERETTE L. HERNDON, JR., CEC, USN
P.E., N.C. and Va.
Operations Officer
Amphibious Construction Battalion One
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Amphibious Construction Battalions (ACBs) are very mobile and on the move. The dramatic growth in the Navy's Strategic Sealift Program has put the ACBs (or PHIBCBs) in the limelight with new taskings, hardware, training requirements, and increased personnel strength.

There are two PHIBCBs: "ONE" is on the West Coast at Naval Amphibious Base (NAB) Coronado, Calif., and "TWO" on the East Coast at NAB Little Creek, Va. The two battalions are not a mirror image of each other due to differences in fleet operational procedures. Both battalions, however, have the same mission. This article is from PHIBCB ONE's viewpoint.

The word "construction" in our name is misleading to those outside of the Naval Beach Group (NBG). The key word is "amphibious" because that is the nature of our business. The PHIBCBs along with the Beachmasters and the Assault Craft Units comprise the NBG. The NBG, working for the Amphibious Group Commander, provides amphibious ship-to-shore logistics in support of the Marines.

In other words, the NBG is that vital link to get the Marine supply line established from the amphibious "gray hulls" and continue to support those Marines, once ashore, from commercial "black hull" shipping.

As a part of that link, the mission of the PHIBCBs is to provide causeway and fuel system elements to the Amphibious Task Force Commander in support of the naval beach party during the assault and later phases of the amphibious landing operation.

In amphibious operations, PHIBCBs task elements to support the Marine operation. There are four levels of Marine operations which the PHIBCBs support, i.e., the Marine, Amphibious Unit (MAU), and the Marine Amphibious Brigade (MAB), the Marine Amphibious Force (MAF), and the Marine Prepositioning Force (MPF).

The MAU is comprised of 1,800 to 4,000 Marines embarked on the Amphibious Ready Groups (ARGs) as part of routing WESTPAC deployments. The MAB consists of 8,000 to 18,000 Marines, and MAF level operations would involve 50,000 plus. The MPF is a new mission which consists of 13 self-sustaining ships forward deployed in three independent, prepositioned squadrons.

Each squadron carries the equipment and 30 days of supplies for an MAB. Air-lifted troops will join with the sea-lifted combat equipment. Cargo consists of a balanced spreadload of vehicles / equipment, containers / pallets, fuels, lubricants, and potable fresh water.

Each ship is outfitted with ship-to-shore lighterage. The MPF will be offloaded pierside or in-the-stream by Naval Support Elements (NSE) and by Marine Corps personnel airlifted to the objective area. MPF-ONE consists of four ships and is located in the Atlantic. MPF-TWO consists of five ships and MPF-THREE, four ships. Both MPF-TWO and THREE are located in the Western Pacific / Indian Ocean.

	MAU	MAB	MAF	MPF
Task Elements				
Lighterage	1	1	2	20
AABFS, Buoyant	1	1	3	5
Causeway Pier	0	1	2	0
Salvage Element	1	2	4	8
ELCAS	0	1	2	0
Camp Support	0	1	2	1

Figure 1 — Mission Requirements: The number of PHIBCB task elements required to support different levels of Marine operations.

Lighterage An amphibious operation involves transporting multitudinous amounts of cargo from ships to shoreside interface. The cargo may be rolling stock, containerized cargo in 8- x 8- x 20-foot containers, or break bulk cargo which may be in a variety of configurations and weights. The shoreside interface may be a pier or wharf, a causeway either floating or elevated, or the beach itself. The equipment commonly utilized to perform lighterage operations consists of LCUs, LCM-8s, and PHIBCB causeway ferries.

The causeway ferry is normally made up of three or four causeway sections. The ferry may either be propelled by a warping tug or a causeway section powered (CSP). The causeway ferry finds its biggest workload in the MPF mission. Vehicles, equipment, and materials are loaded onto the causeway ferry via ship cranes or RO/RO platform, if available. A causeway ferry (1 CSP + 3 sections) can carry a capacity of approximately 322 tons.

Once the ferry hits the beach, Marine drivers man the vehicles and take them to shore, and containers are offloaded via the Marine's Rough Terrain Cargo Handler (RTCH).

AABFS, Buoyant The Amphibious Assault Bulk Fuel System (AABFS), Buoyant is a reel-laid transfer system that links a ship (usually an LST) with a shore-based fuel storage system. The system is for short-term use, normally less than 30 days. The system consists of a diesel-powered hose reel with 5,250 feet of six-inch diameter flexible hose, buoys, and anchors. The hose can be deployed from an LCU, a sideloadable warping tug (SLWT) or an LCM 8 assault craft. With 100 psi discharge pressure at the ship, the AABFS can deliver over a million gallons of fuel per day.

Causeway Pier To rapidly transfer wheeled and tracked equipment from ship to shore, the causeway pier is designed to bridge the gap between the LST and the shore. A causeway pier normally consists of four to twelve causeway sections. The causeway sections would be carried to the operational area by the LST. Upon arrival, the causeways are launched from the ship and assembled into a pier by PHIBCB SLWT crews. Once assembled, the pier is inserted on the beach, anchored on the sea-end and dead-man anchored on the beach with D-8 dozers.

Salvage Element The PHIBCBs provide the dozer and crew to the Beach Party Teams for amphibious operations. The Beach Party Team is a task element of the Beachmaster Unit. The Beachmasters control the beach from the surf zone to the high water mark. They mark the beach, establish boat lanes, control the movement of lighterage to the beach, perform beach salvage, and maintain communications links. Salvage consists of pushing broached or damaged craft off the beach and pulling vehicles or equipment that become stuck on the beach.

ELCAS The Elevated Causeway provides the capability to offload containers from lighterage beyond the surfline and quickly move the cargo ashore via flatbed trucks on the elevated roadway. The ELCAS permits the offload of equipment and supplies in areas where a shallow beach gradient would prevent landing craft from getting close enough to the shore to discharge and to offload beyond a rough surf zone.

Camp Support Support for amphibious operations may consist of hundreds of personnel who require berthing and messing on the beach. The PHIBCBs provide, install, and maintain tents, galley facilities, showers, fresh water production, electrical power supply and distribution, telephone installations, water disposal and sanitation. Construction of a "tent city" requires extensive planning, and maintenance is an around-the-clock operation.

To accomplish its six mission task elements, the battalion is organized in two line companies and a headquarters company. The line companies are designated "Alfa" and "Bravo."

Alfa Company contains the occupational field 13 (OF 13) ratings. Approximately 170 personnel are assigned to Alfa Company, with a CEC lieutenant as company commander. Alfa Company is composed of four platoons — Transportation (EOs), Maintenance (CMs), Causeway Construction (SWs), and Camp Support (CEs, BUs, UTs). Alfa Company has many diverse functions.

The company dispatches and maintains 280 pieces of Civil Engineer Support Equipment (CESE) worth $25 million. Steelworkers construct eight new causeways per year and rehabilitate existing causeways needing repair. The battalion has an inventory of 65 causeway sections. Operationally, the company installs the ELCAS, provides the salvage element, and performs the camp support function for the entire NBG.

Bravo Company personnel are the operators of the PHIBCB mission statement. Bravo Company is assigned the manpower and the equipment to provide the causeway and fuel system elements. The company consists of 150 men and women in the boatswain's mate, engineman, and signalman ratings with nonrated seamen as the balance of the workforce.

The company commander is a CEC lieutenant with CWO bos'ns assigned as officers-in-charge of deploying detachments. Operationally, the company provides the barge ferrys, installs the causeway pier, and installs the AABFS. Additionally, the company maintains and operates the equipment to sideload causeways on the LSTs.

Completing the battalion organization is headquarters company consisting of the administrative, training, operations, and supply departments. The company has 60 personnel that provide staff functions to support both line companies.

To explain what's currently happening in the PHIBCBs as a result of the strategic sealift program, an analysis of the mission statement reveals three key points to focus on: causeways, fuel systems, and initial assault and later phases of the amphibious landing operation.

Initial Assault and Later Phases

The growth of the 600-ship Navy did not include a similar growth in the amphibious "gray hulls," however, DOD requirements for sealift were continuing to expand. These two divergent factors were creating a growing void. That situation was addressed in 1984 by the Secretary of the Navy when he designated strategic sealift as a distinct Navy function.

A major concept of strategic sealift is the use of commercial cargo ships and bulk fuel tankers in support of amphibious operation. In taking this approach, two phases of an amphibious operation were established, the Assault Echelon (AE) and the Assault Follow-On Echelon (AFOE). The AE was defined as day D+1 through D+5 with those assets of the MAB or MAF that would be transported on "gray hulls." The AFOE was defined as D+6 through D+180 with those MAB or MAF assets being transported by commercial cargo shipping.

By its very nature, an amphibious landing involves the ship-to-shore movement of cargo in areas without ports. This factor was incompatible with large deep-draft cargo ships. Additionally, commercial shipping was almost exclusively done in containers and military cargo loads were not compatible with commercial shipping hardware. As such, two basic sealift support systems were developed: (1) sealift enhancement features to improve the ability of dry cargo ships and tankers to carry and handle military loads and (2) ship-to-shore systems which move cargo over the beach.

The ship-to-shore systems were labeled Cargo Offload and Discharge Systems (COLDS). COLDS facilities are primarily in support of the AFOE phases of operations. It is the subsystems of COLDS which provide the PHIBCBs with the new hardware in support of its expanding mission due to strategic sealift. The subsystems of COLDS are shown in Figure 2 and discussed in the analysis of causeway and fuel systems.

Causeways

If there is one piece of hardware that identifies a PHIBCB, it is the causeway. The causeway is a floating platform 90-feet long, 21-feet wide, 5-feet high, and weighs 70 tons. The concept of the causeway was developed during World War II. The causeway or causeway section, nonpowered (CSNP) is assembled from 45 pontoon cans, each 5-feet x 5-feet x 7-feet.

There are nine different types of pontoon cans used to assemble causeway sections depending on the function. The causeway section is the basic component of the causeway pier and a barge ferry lighterage element. Conventionally, propulsion for the barge ferries are provided by warping tugs.

A warping tug is a basic causeway section with two outboard prop-type engine units installed with a winch, anchor, and "A" frame. Warping tugs are also used to install and maintain the causeway pier, install fuel systems, and serve as a salvage craft when required. Causeway sections are designed to be "side-loadable" on an LST. An LST can be side-loadable with four causeway sections. Likewise a warping tug can be sideloaded, hence, the term side-loadable warping tug or SLWT.

In the new COLDS system, the same basic causeway is being modified for the three platforms that comprise the COTS subsystem: ELCAS, RO/RO, and CSP/SLWT.

The Elevated Causeway System is a recent addition to PHIBCB tasking and is one of the most challenging evolutions. The ELCAS is constructed of causeway sections and steel pile. The modification is the addition of spudwells on the causeway sections to receive the piling. Once the piles are driven, the causeways are elevated by hydraulic power systems and jacks. When the desired elevation is reached, causeways are pinned to the piles.

After construction, a 140-ton crane is positioned on the pier head to offload containers from lighterage. An air-cushioned turntable on the pierhead provides a rapid turnaround for Marine Corps trucks to carry the containers ashore. The current ELCAS consists of six roadway causeway sections and six pierhead sections, making the ELCAS 810 feet long.

The pier head is two sections wide and three sections long. Since the facility is modular, it may be expanded by enlarging the pierhead and/or adding roadway sections. Major equipment required to install the system are two DE-30 diesel pile hammers, two 30-ton hydraulic cranes, one 65-ton hydraulic crane, three RT forklifts, four welders, two D-7 bulldozers, one eight-ton hydraulic crane, and a lift system consisting of three hydraulic power units and 12 five-ton hydraulic jacks. In August 1985, a 12-section ELCAS was installed in 110 hours, using two crews, at Coronado, Calif.

The RO/RO discharge facility consists of six intermediate causeway sections with side connectors installed, which permit assembly into a platform two sections long (180 feet) and three sections wide (63 feet). A self-sustaining Roll-On/Roll-Off ship can position its ramp on this platform to permit vehicles to be driven off the ship and onto a waiting causeway ferry. The addition of a "sea end" causeway section allows LCUs to receive vehicles and transport them to the beach.

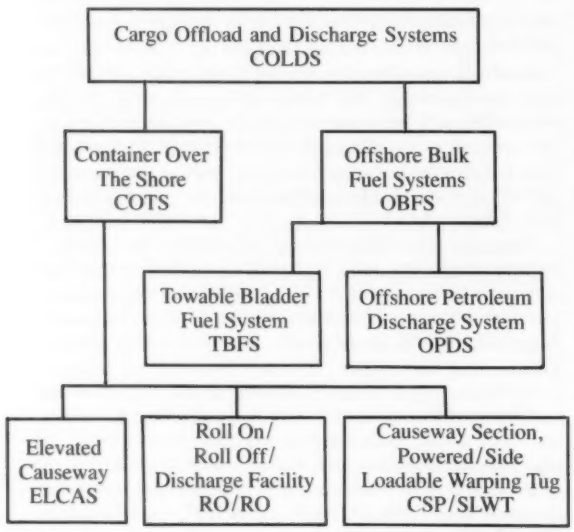

Figure 2. Subsystems of COLDS

Not all RO/RO ships have a self-contained ramp. The RO/RO facility includes a 120-foot long RO/RO ramp (which comes in three 40-foot sections) and can be connected to the sideport of a nonself-sustaining RO/RO ship for the drive-off discharge of vehicles. There is currently one RO/RO facility which is in the Atlantic Fleet with PHIBCB TWO. The West Coast RO/RO is scheduled for delivery in FY 1987.

A major subsystem of COTS is the CSP/SLWT. As mentioned earlier barge ferrys and piers were operated with SLWT, i.e. a causeway with prop-units installed. The new CSP/SLWT are still the basic causeway sections, however, the modification is quite extreme.

A waterjet propulsion assembly (WPA) was developed containing a diesel engine and waterjet with a 360-degree rotatable nozzle. Two WPAs and a center section with fuel tanks and battery compartment replaced 12 pontoon cans on the end of the causeway to comprise a causeway section, powered or CSP. A CSP with a series of causeways connected make up a causeway ferry or barge ferry. The CSP barge ferry can transport vehicles, supplies, and containers directly ashore, or to the ELCAS for offload.

Additionally, the CSP works very efficiently with the RO/RO platform. Like the conventional SLWT, when a winch, anchor, and "A" frame are added to the CSP, a waterjet SLWT is produced capable of performing the same task. Both new waterjet craft are extremely maneuverable and work much better in the surf zone with only minimal draft required.

Fuels

The AABFS, buoyant fuel system has been the main-stay of amphibious fuel operations for some time. Its role is primarily in the AE mission. However, the fuel system for the AFOE phase of operations has only recently been developed and evaluated. Delivery to the fleets will be in future years. The offshore bulk fuel system (OBFS) consists of the offshore petroleum discharge system (OPDS) and the towable bladder fuel system (TBFS) (Figure 2).

OPDS is a commercially produced system using off-the-shelf technology to provide bulk fuel discharge from large tankers across an unimproved beach. It supports the fuel requirements of Army, Air Force, and Marine Corps units operating ashore. The system consists of four miles of flexible, steel-reinforced "float/sink" piping, a temporary spread moor for a tanker, and a single point moor called a single anchor leg moor (SALM).

The tanker sets a spread moor and deploys the pipe to the shore with the assistance of four SLWTs. Within 48 hours the tanker is ready to pump POL to the beach at the rate of 1.2 million gallons per 20-hour day. Within seven days the 900-ton SALM is installed with the assistance of four SLWTs, and it provides uninterrupted POL delivery. The SALM permits a tanker to remain on station, and pump in much higher sea states than is possible on the spread moor. The SALM is recoverable and can be towed or lifted to a new location and reinstalled.

The PHIBCB tasking with OPDS is to provide and operate the four SLWTs required to deploy the pipe ashore, assist the ship in achieving the spreadmore, and moving the SALM. Additionally, diver support from the Underwater Construction Teams (UCT) is required for installing and recovering the SALM. The first OPDS ship was the USNS Potomac. A total of five are scheduled for delivery through FY 1992.

The TBFS is an expansion of the AABFS hose reel system. TBFS consists of four bladders 220 feet long, 11 feet in diameter, with a capacity of 135,000 gallons. A commercial tanker, at some distance offshore, would discharge fuel into the bladders. SLWTs would tow the bladders to within 5,000 feet of the beach. At that point, a floating fuel pump is installed which pumps the fuel ashore through the AABFS buoyant system. The floating fuel pump is powered by a mobile electric power unit located on shore. Additionally, four propellant-embedded anchors are included for holding the bladders and floating pump. The first two TBFSs are scheduled for delivery in FY 1990.

Personnel

The battalion's personnel strength has been at 380 enlisted and 13 officers fairly consistently for a number of years. This level of manning would support an MAB level operation. An MAF-level operation would have required the reserve component of the battalion to be activated plus an augmentation from the other PHIBCB battalion. The reserve component consisted of one detachment with 103 billets.

The tasking placed on the battalion to meet the new MPF mission and the expanded MAB/MAF AFOE requirements did not come with additional active duty billets. These personnel requirements were placed in the reserve component or selected reserves (SELRES). The resultant growth in reserve billets has been staggering. Reserve billets increased from 8 officers/103 enlisted to 8/243 in FY 1984, 13/387 in FY 1985, and 22/704 for FY 1987. The programmed increases for SELRES will continue to grow through FY 1991 with a projected total of 25 officers and 814 enlisted personnel.

To manage and coordinate the training for this extensive reserve program, each PHIBCB was programmed for an active duty increase of three officers and 24 enlisted in FY 1987. Figure 3 shows the personnel allowance as it is currently programmed for FY 1987.

Training

Training in the PHIBCBs ha historically consisted solely of on-the-job training/hands-on experience. Not only were there no schools, there were no formal courses and limited text material and training aids. With just the two commands, the number of personnel requiring such training did not support the development of these typical training materials.

The COLDS subsystems developed through Integrated Logistics Support (ILS) include requirements for training support. Courses of instruction were developed for CSP/SLWT operations, ELCAS installation and retrieval, as well as courses in maintenance on these systems. Likewise, courses of instruction will be delivered with the RO/RO, OPDS, and TBFS systems.

Officer	Enlisted
	Active Duty
9 CEC	274 Shore
6 Line	130 Sea
1 Supply	186 OF-13

Figure 3. Personnel allowance allowed for fiscal year 1987.

63 complete basic training

Basic Class No. 179 graduated from the Naval School, Civil Engineer Corps Officers on September 12, 1986, and 63 young naval officers — 52 men and 11 women — accepted assignments in all corners of the world. The class completed eight weeks of specialized training pertinent to the Navy's needs for shore installation engineering, public works management, and Seabee operations.

Nine class members finished with honors: Lt. Anthony V. Ermovick was the outstanding graduate. Graduating with distinction were Lt. James P. Gerner, Lt. Donald L. Maconi, Ens. Stephanie D. Curran, Ens. Stuart L. Dahl, Ens. Schleurious L. Gaiter, Ens. James M. Holcomb, Ens. Peter S. Lynch, and Ens. William M. Turner.

Lt. Ermovick's photograph is indicated by a (★). Officers graduating with distinction are indicated by a (•), and those entering Seabee duty are indicated by a (†).

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Continued on next page

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Ens. Groff, Harold L.
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MPF and FOE requirements for each PHIBCB includes 80 barge ferry and SLWT crews. The majority of these crews are manned from the reserve component. With the exponential growth in reserves, the normal two-week active duty and weekend training via OJT would not meet the demand to have these reserve crews trained in a timely fashion.

A significant accomplishment within the past year has been the development of three formal schools to teach a course of instruction for barge ferry coxswains, barge ferry pilots, and barge ferry engineers. The Naval Amphibious School in Coronado began classes in October 1986. The development of courses is the result of extensive coordinated effort between the Naval Amphibious School, NAB Coronado, Civil Engineer Support Office (CESO), NAVFAC, OP-42, and both PHIBCBs.

Peacetime

The PHIBCBs are unique in that the contingency mission requirements and peacetime employments are the same. The six mission task elements described earlier are the same in routine peacetime training. The Amphibious Group Commander directs Amphibious Refresher Training (PHIBREFTRA) for all amphibious ships. When the LSTs conduct their training, the PHIBCBs are required to support that training by sideloading causeways on LSTs, assembling and installing causeway piers, working with the LST while conducting pier marriages, providing the salvage element, and maintaining a camp support on the beach.

The battalion routinely organizes and trains two causeway and fuel team detachments for WESTPAC deployments per year. Typically there is a detachment continually deployed for six months, then relived by another detachment (det). When exercises are scheduled during the deployment, the deploying det will be sized accordingly.

The battalion has recently participated in several major exercises. During August 1985, PHIBLOTS 85 was conducted on the Silver Strand in Coronado. The exercise provided a unique opportunity for the entire Naval Beach Group including PHIBCB ONE to train for a two-week period. PHIBCB ONE exercised all mission taskings including the first operational use of the ELCAS on the West Coast, installation of fuel systems, discharge of vehicles over the causeway pier, barge ferry operation for container offload from MPF ship, and provided the messing, berthing, and all other complete camp support functions for a 1,000-man camp.

Team Spirit 86 was conducted during March/April 1986 in Korea and included two causeway teams from the battalion along with the deployed fuels team. The exercise was included in a five-month deployment during which causeways were sideloaded and transported throughout WESTPAC.

Freedom Banner 86 was the first offload exercise of an embarked MPF ship in the Pacific. The battalion deployed 88 active duty and reserve personnel which comprised eight barge ferry crews plus other beach support functions. The exercise was held in Subic Bay during May 1986.

During July 1986, PHIBCB ONE participated in the Logistics-Over-The-Shore (LOTS) phases of Gallant Eagle 86. The JCS-directed exercise gave the battalion its first opportunity to conduct operations with the Army. □

Seabee readiness ensured

By CDR R. F. KIESLING, CEC, USN
P. E., La.

In homeport, the battalion receives readiness training in the form of a simulated contingency environment for a short duration. Exercises such as rapid runway repair, contingency camp construction, disaster recovery, Air Detachment (Det), Embark, and Field Exercise are all designed to prepare the battalion for "the real thing."

On deployment, the battalion exercises its construction capability for a sustained period while Embark and military training are of short duration. Traditionally, deployed military and construction performance has been the method used to measure a battalion's readiness capability. However, since our deployment sites are all at existing U.S./NATO bases, we are not able to adequately test the "contingency environment" portion of readiness. Thus the need arises to find a construction mission in a contingency environment in order to provide an adequate test of our readiness.

Testing for Readiness

Recently, two types of contingency environment taskings have been developed/expanded in order to test a det's readiness: special dets and Field Exercises. If each battalion has a det that has gone through these taskings the det members can impart their knowledge and decrease the learning curve for the rest of the battalion.

Special Dets

"Special dets" are designed to test the ability to perform normal construction tasking for a "sustained period" of time at unusual sites, i.e., where traditional Navy support functions are not available. While these dets are provided adequate berthing, they must fend for themselves in most other support areas, i.e., messing, material procurement, equipment needs, recreation, etc., must all be obtained from the local community or non-DOD sources. In addition, normal construction support services such as engineering, MLO, and ROICC are nonexistent so these functions must also be performed by the det.

Two special dets have been deployed: A 13-man det from NMCB-133 recently completed its tasking to upgrade security at the American Embassy in Algiers, Algeria. This det lived in leased quarters but had to arrange all other support through the local economy or to a lesser extent through the very limited Embassy support system.

(left) Typical WATCH civic action project. Preparing the site for an open-air-market in Sierra Leone, Africa.

(right) NMCB-133 Special det to Algiers. Replacing the Embassy perimeter wall. Civilian clothes are worn to maintain low profile.

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For example, the det found it difficult to arrange material and equipment support on the local economy since much of the construction industry is government controlled. The language barrier, local customs, and attitudes also made this a difficult deployment site. The det, however, overcame all of these obstacles and completed the tasking.

A nine-man det from NMCB-7 recently completed its tasking to upgrade a Navy facility at Munich, Germany. Although this site had good local support for material and equipment, it did provide a challenge for the det to make things happen in an Army supply and support system. Both dets performed exceptionally well and developed some extremely valuable lessons learned.

A 12-man det from NMCB-5 is currently on the island of Lampedusa, Italy, and is tasked with improving the security at a Coast Guard Loran Station. All support is via chopper from Sigonella. The rough terrain, logistics problems, and threat of terrorist attack provide some unique construction challenges.

Additionally, NMCB-62 has a 13-man det in Freetown, Sierra Leone, Africa, doing a project similar to the Embassy upgrade in Algiers, Algeria. One future Special Det is planned for Fall 1986: NMCB-4 will be sending an eight-man det to Cairo, Egypt.

Field Exercises

Field Exercises are designed to test a unit's ability to effectively operate in a "contingency environment" for a relatively short duration. Seabee dets participating in these exercises must perform most or all aspects of the exercise such as:

- Plan, estimate, and accomplish the tasking
- Develop MTOs, follow-up and/or procure material
- Develop Embark and retrograde plans and perform same
- Plan and carry out camp and job site security and defense
- Plan and arrange berthing and messing
- Get to and from the project site

When a det returns from a successful exercise it has been well tested on performing effectively in a contingency environment.

Although there have been numerous field exercises over the past several years, such as NMCB-1's det to Beirut (which was "the real thing"), NMCB-133's participation in Ahaus Tara I, and NMCB-74's participation in Ahaus Tara II, some of the more recent ones are outlined here.

NMCB-3 deployed a 35-man det with 14 pieces of CESE by C5 aircraft to Puerto Cortes, Honduras, for training in war-damage repair. They berthed in tents, set up a field galley for messing, and completed their tasking to repair a seawall with much praise from the on-site local and U.S. forces.

NMCB-74 deployed a 22-man det with 10 pieces of CESE to Tiger Island, Honduras, to exercise Seabee well-drilling capability. The det lived aboard the local Honduran navy base and set up their own field galley. When Army chopper support fell through, the det had to improvise to transport their equipment across to the island. Using one dilapidated Honduran barge with no lifting capacity and combating 10- to 12-foot tides, the det took three days of hard labor to get their equipment on site. Once in place, they successfully completed their tasking.

NMCB-1 deployed two dets to Honduras: One 20-man det was tasked with well drilling as part of joint exercise Blazing Trails 86. They were expected to drill wells in advance of a road building operation run by the U.S. Army. The second det of 35 men deployed to Puerto Cortes to perform Phase II of the war damage repair scenario on the base seawall. Both dets performed superbly and accomplished the tasking in spite of the arduous conditions.

Numerous battalions have participated in West African Training Cruise (WATC) over the past couple of years. These 10- to 12-man dets go through shipboard training with Marines and then deploy for two to three weeks doing civic action projects in West African countries. The accomplishments of these dets have been amazing in light of the extremely difficult living and working conditions in Africa.

Due to the training value that results, and the chance to test the readiness of our Seabee units, more of these special dets and Field Exercises are planned for the future. This is one more step to ensure that Seabee readiness is maintained. □

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